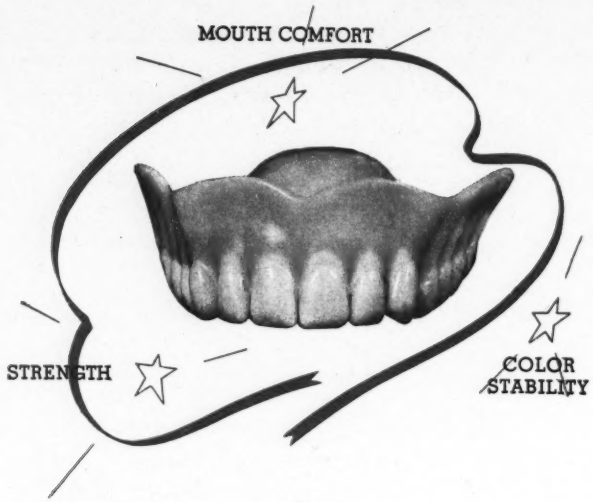
THE DENTAL DIGEST

MAY, 1937



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Fistulas of the Face and Neck

FLOYD E. STRAITH, D. D. S., Detroit

FISTULOUS TRACTS AND sinuses with external openings on the face or neck are observed by both physicians and dentists. Frequently, treatment is instituted without sufficient investigation as to their cause.

Types of Fistulas

Mandibular Fistulas — Openings along or beneath the inferior border of the mandible resulting from a localized cellulitis following infection of the apical tissues of a lower tooth are still frequently observed. They are usually associated with a history of a tooth that ached severely for a few days; felt long in its socket, and was sensitive to bite upon; this was soon followed by a swelling of the adjacent gum tissues, and then by an external swelling which ruptured or was incised and then discharged a purulent exudate; at that time the pain subsided. Subsequently for a long period the opening usually alternately closes and then slowly enlarges and again ruptures at the surface, discharging a small amount of pus. In some cases there may be a few drops of exudate daily with no apparent surface healing. Such a history may extend over many years. Often, the tooth may have been removed at the time of or following the first complaint.

Roentgenographic examination of the jaw both by means of small dental films and lateral jaw plates should be made to determine the tooth or teeth involved. The insertion of a probe in the fistulous tract or injection of a radiopaque medium before making the exposures will prove of diagnostic value in localizing the seat of disturbance (Fig. 1). In cases in which the causative teeth were supposedly removed, the roentgenograms may reveal root fragments, pieces of foreign material, such as broken restorations, or persistent unresolved granulomatous or cystic areas.

Fig. 2 shows a case of localized swelling from an infected lower molar of several weeks' duration which suddenly became acute and was about to rupture when the patient presented for treatment. Prompt external incision and drainage with removal of the offending tooth resulted in rapid healing with minimum scar formation. This type of swelling and the persistent draining sinuses resulting therefrom, may usually be prevented by early incision through the buccal mucous membrane and periosteum over the apical area of the tooth involved.

The fallacy of "waiting until the swelling goes down" before any operative intervention is attempted is at direct variance with one of the cardinal principles of surgery: incision and drainage as early as possible. In such cases when treated early, the simple extraction of the tooth will often suffice. The treatment of such fistulous tracts is accomplished by removal of the cause, whether the cause is the tooth root, a granuloma, or cyst. Currettement of the granulomatous areas and complete enucleation of the cysts are essential.

Fig. 3 shows a young girl with a draining external opening below the lower border of the mandible of several months' duration. The patient gave the usual history of toothache with swelling and discharge, followed by slight but persistent drainage. Roentgenographic examination revealed a channel formed on the lingual surface of the mandible, leading from the apex of the mesial root of the lower right first molar to the external opening (Fig. 4). A probe inserted into the external sinus could be felt within this channel lying just beneath the lingual periosteum. Removal of the tooth with currettage was followed by prompt healing.

Fistulas of Chin—Disregard of the underlying causes of external sinuses in the midline of the chin have been frequently observed. Figs. 5, 6, 7, and 8 show two women, each with a sinus of several years' duration. The one in Fig. 5 gave a history of fifteen years' periodical discharge from this area and several operations for currettage of the bone through this opening, but no roentgenographic examination had ever been made. The roentgenograms of the lower anterior teeth (Fig. 6) disclosed a large area of bone destruction involving the roots of the incisors. Incision labially into this area revealed all four root-ends to be denuded. Extraction of the teeth and enucleation of the cyst, followed by open packing, resulted in uneventful and complete healing.

Fig. 7 shows a fistula of the chin of seven years' duration. The patient stated that she had been to several physicians and dentists in an endeavor to find the cause. Originally, the area on her chin, which she described as a pimple, was incised; some discharge followed. Repeated healing followed by slight swelling and then rupture with discharge of a few drops of pus was the course over the subsequent five years. Two years before the patient presented herself for

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Fig. 1—Probe leading to infected unerupted third molar from persistent external sinus. Second molar previously removed as apparent cause.

Fig. 2—Localized cellulitis due to lower molar about to rupture.

Fig. 3—Draining fistula of several weeks' duration due to lower first molar.

Fig. 4—Channel in lingual surface of mandible below first molar leading to external opening.

Fig. 5—Fistula of chin of fifteen years' duration.

Fig. 6—Cyst about lower anterior leading to fistula shown in Fig. 5.

Fig. 7—Fistula of chin of seven years' duration.

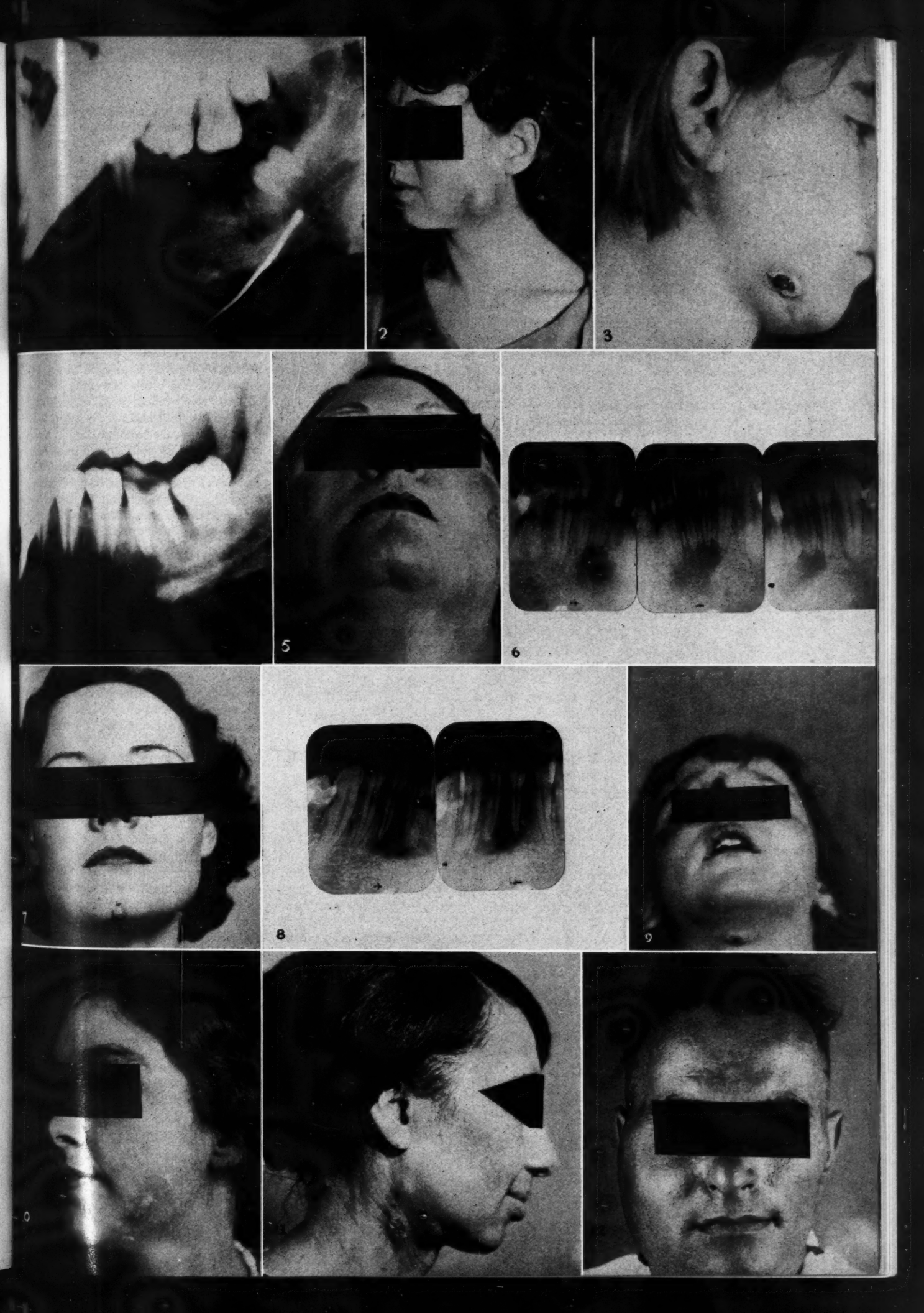
Fig. 8—Cyst about lower anterior of case shown in Fig. 7. Opening through labial plate clearly shown.

Fig. 9—Thyroglossal cyst fistula.

Fig. 10—Fistula of cheek due to Vincent's organisms following extraction of upper third molar.

Fig. 11—Actinomycosis of neck following extraction of lower third molar.

Fig. 12—Acute parotitis treated by massage and irrigation.



treatment, the bone had been curretted through the external opening, but nothing was accomplished. At no previous time was roentgenographic examination made. Roentgenograms taken at the time of examination revealed a cystic area about the apexes of the lower central incisors (Fig. 8). The exit through the labial alveolar plate is clearly shown. Removal of the involved teeth and currettage of the cystic area resulted in prompt healing.

Some of the external fistulous openings of mandibular origin may give no manifestation of local inflammation within the mouth but by careful questioning of the patient as to the history, the most likely etiologic site may be determined. Roentgenographic examination of the questionable area with the use of such diagnostic aids as probes and disclosing mediums will generally localize the seat of infection (Fig. 1).

Old infected fractures of the mandible should be considered when the etiology is obscured and there is a history of a recent blow or injury.

An old, apparently healed cellulitis may recur without much swelling but result in an opening with discharge at the old point of incision. Every effort should be made to determine whether or not a sequestrum, osteomyelitis, or any other cause can be found which would account for the recurrence. In any case, thorough drainage will constitute an important part of the treatment.

Thyroglossal cysts or ducts may result in an opening in the midline of the neck below the chin and at or slightly above the thyroid cartilage (Fig. 9).

Maxillary Fistulas — Openings in the skin surface of the cheek or upper lip occasionally arise from infections originating in maxillary teeth, but less frequently than those from infections of the lower jaw. Fig. 10 shows a fistulous tract that formed several weeks following the removal of an upper third molar. The mucous membrane over the site of extraction was apparently healed but slightly reddened. A probe was passed from the external opening directly into the cheek upward, inward, and backward to the site of extraction. Smears of this tract revealed a preponderance of Vincent's organisms. Cauterization of the tract with trichloracetic acid resulted in prompt closure.

Actinomycosis — Actinomycosis is not an uncommon finding, arising from infection of extraction wounds, or even through an open cavity in a tooth. Such a case is shown in Fig. 11 following extraction of a lower third molar. The slow-forming, painless, nodular growths rupture at various intervals and then tend to heal with considerable scarring, to be followed by a new swelling adjacent to the old. This course may persist for months. Diagnosis of the organism can often be made by compression of the granules found in the excretion upon a slide and examining under a microscope or culturing in special mediums. Roentgen and potassium iodide therapy is the specific treatment.

Salivary Fistulas—Salivary fistulas opening upon the face are usually the result of accidental lacerations severing the duct to the gland or causing a break in the glandular capsule. This may also result from necessary operative intervention in cases of cellulitis or infection of the gland. Such fistulas are resistant to closure and may require careful approximation of the ends of the severed duct or roentgen therapy of the gland to reduce or eliminate its secretion.

Injudicious incision of a large fluctuating mass in the cheek or below the mandible may result in the creation of a salivary fistula. In such cases the history, in addition to the examination, should give a rather clear indication as to whether or not the condition is acute. Acute infections of the parotid or submaxillary glands may cause marked external swelling. Pain, high temperature, trismus (if in the parotid), a reddened duct orifice, and the expulsion of pus from the duct should confirm the diagnosis. Roentgenographic examination and probing of the duct for calculi are indicated. Any calculi present should be removed as early as possible. If none is found, roentgen therapy and irrigation of the duct will usually stimulate drainage and reduce the infection. This is particularly true of parotid infections. Submaxillary infections may have to be incised to provide sufficient drainage.

A case of acute infection of the parotid is shown in Fig. 12 which cleared up in a week's time without external incision, by massage and irrigation of the gland through Stenson's duct.

In making a differential diagnosis of swellings in these regions, aspiration should be resorted to in all cases in which there is doubt.

A blow upon the side of the face or a fracture of the mandible will often cause a rupture of the fascial capsule of the parotid with an extravasation of salivary secretion into the tissues of the cheek just beneath the skin surface. Fluctuation is readily apparent. Incision into such areas inevitably results in the creation of a salivary fistula often extremely difficult to close. Repeated aspiration of these areas, followed by the application of a pressure bandage, has in my experience resulted in the elimination of extraneous fluid without incision.

Ranulas of the submaxillary or sublingual glands may result in marked external swelling and, if aspiration is not used in the diagnosis, precipitous incision for drainage would create a fistula (Fig. 13).

Fractures of the maxilla and infections of the upper jaw may result in discharging sinuses remote from the teeth themselves. A dacryocystitis is often seen following fractures of the maxilla involving the nasal bones or infra-orbital ridge, and calls for the attention of a rhinologist. Postextraction infections may result in an ascending involvement of the tissues below the eye (Figs. 14 and 15). In such cases, incision and drainage are necessary and occasionally currettage of the underlying bone to prevent persistent fistulas.

Malignancies—As a word of caution, fistulas through the cheek or lips may not have an infectious, cystic, or salivary origin but nevertheless may be fundamentally of dental origin. Irritation from rough teeth, roots, crowns or other restorations may initiate a cancerous lesion that may perforate the cheek (Figs. 16 and 17). The uncompromising elimination of such irritating factors is the dentist's responsibility.

Comment

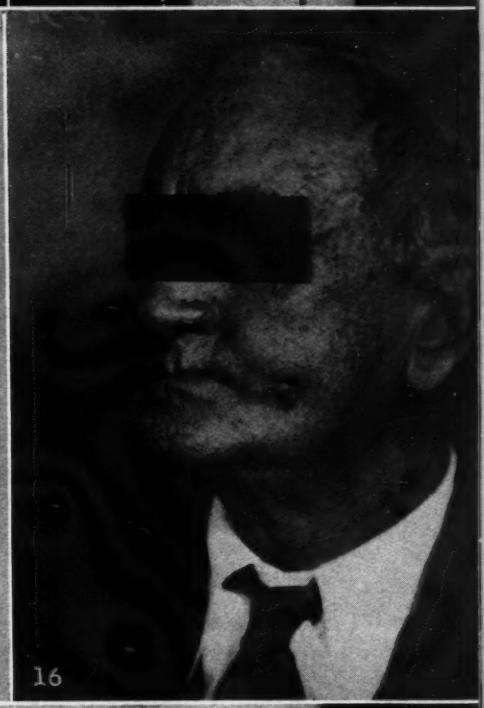
Treatment need not end with the stoppage of discharge and the healing of the skin opening. Many of the resultant scars are depressed, adher-

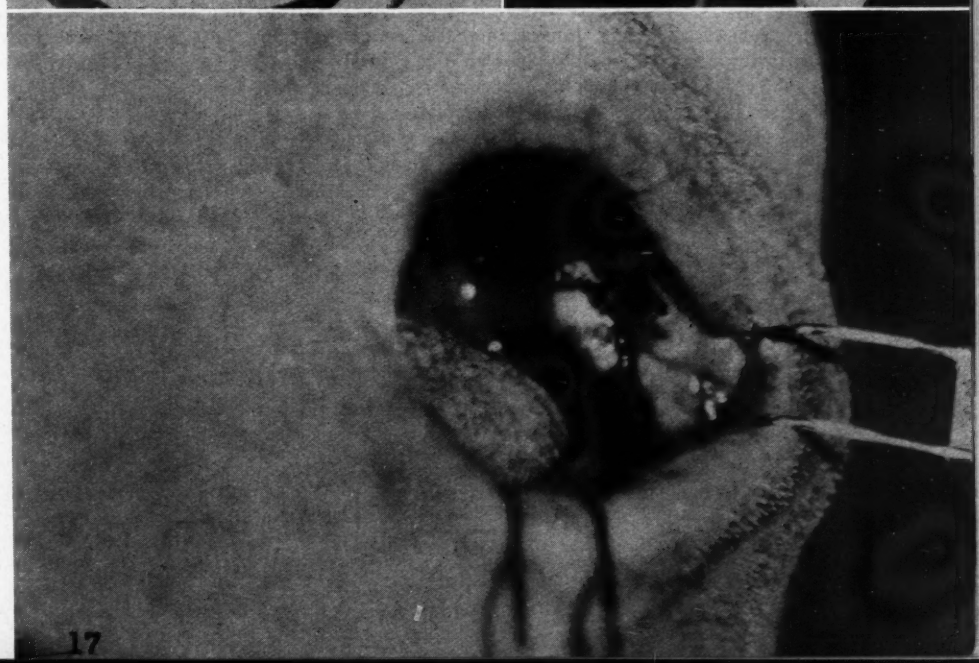
Fig. 13—Ranula of submaxillary gland.

Figs. 14 and 15—Infection localized below the eye following extraction of upper teeth.

Fig. 16—Fistula of cheek from perforating carcinoma of dental origin.

Fig. 17—Inner aspect of cheek shown in Fig. 16. Carcinoma from irritation of broken bicuspid.





ent, and disfiguring. Simple plastic excision of the scar may be performed and the wound sutured with subcuticular stitches, leaving an inconspicuous line on the skin surface.

Summary

1. Fistulous openings about or below the mandible should primarily be considered as of dental origin, and roentgenographic examination of the teeth and mandible should be made.

2. The use of probes and radiopaque disclosing mediums should be utilized.

3. Early diagnosis of apical root infections and cysts will prevent many persistent fistulas.

4. Acute infections and cellulitis of the face demand early incision and drainage when fluctuation is present, and abortive measures are of no help.

5. Operative intervention for elimination of the origin of infection is of major importance.

6. External incision of glandular enlargements or of masses containing salivary secretions should be the last resort.

7. Aspiration of fluctuating areas should be utilized more frequently in diagnosis.

8. Deforming scars should be excised and carefully sutured to perfect the final result.

1713 *David Whitney Building.*

Hydrocolloid Impression Technique for Inlays and Fixed Bridges

A. W. SEARS, D. M. D., Jacksonville, Florida

THE PURPOSE OF the impression technique to be described is to secure a more accurate impression for inlays and fixed bridge abutments. This method retains the convenience of the indirect technique with the accuracy of the direct method. By following this procedure it is possible to make inlays and bridges that may, if constructed to fit the reproduced mounted cast, be placed in the mouth with the same marginal and positional exactness and a minimum loss of time for adjustment. The accuracy of hydrocolloids used in partial denture construction is unquestioned. Several years of study and practical application have proved the accuracy of hydrocolloids in inlay and fixed bridge construction.

A great amount of time has been given to simplify and clarify this procedure, and every step now included has a definite bearing on the ultimate results. The procedure is inexpensive; most of the items of equipment are to be found in any dental office.

The entire procedure is divided into four parts: (1) carpule loading; (2) impression; (3) bite; and (4) laboratory procedure.

Carpule Loading

Carpule loading can be done by the assistant or technician in spare time. A sufficient supply can be made at one time for many impressions. The formulated hydrocolloid injected into the carpule is sealed, and will remain in usable condition indefinitely. A small part of the material in the carpule is usually sufficient, one carpule often supplying the need for more than one inlay or bridge. Carpules having crimped metal caps are preferable; other type caps will usually not stay in place because of loading pressure. A number of carpules are filled with water at the same time that carpules are filled with hydrocolloid. They are necessary to clean the needle of the impression syringe to prevent the hydrocolloid from drying inside the needle.

Equipment for Loading Carpules

The following equipment is necessary for loading carpules: (1) empty carpules, preferably with metal caps; (2) one 10 cc. Luer syringe with a 19 gauge needle, and (3) a hydrocolloid mixing gun.

Procedure

1. Cut 1¼ inches of hydrocolloid, and measure 25 cc. of water; then place the hydrocolloid and water in a mixing gun.

2. Place the gun in boiling water for four minutes.

3. Preheat the Luer syringe in hot water.

4. Pour liquid hydrocolloid in the Luer syringe three-fourths full. Turn the needle end of the syringe up and expel the air.

5. With a 19 gauge needle, fill the empty carpules by puncturing the metal cap end and forcing hydrocolloid into the carpule until it is about three-fourths full.

6. Repeat the loading of the carpules until the Luer syringe is empty.

7. Refill the syringe with hot water and fill an equal number of carpules with water as those with hydrocolloid. As has been mentioned, these carpules of water are to be used for cleaning the needle after the use of hydrocolloid carpules.

Impression

1. Survey the areas adjacent to the prepared teeth for use as stops.

2. Place a roll of softened compound in each end of the tray or in the area away from the involved teeth for tray balance stops.

3. Impress the tray to these areas within 2 mm. to 4 mm. from the bottom of the tray. These imprints are to serve as a definite seating place for the tray and to suspend the prepared teeth away from contact with the tray. If the compound should flow toward the prepared teeth, trim this excess.

4. From the periphery of the tray, build the compound to contact the tissue, making a complete seal. Care should be exercised to have this seal well beyond the gingival of the teeth and still allow the involved teeth to be in full suspension.

If a study cast of the mouth has already been obtained, it is easy to make these trays in the laboratory before starting on the preparation for inlays or bridge abutments.

Fig. 1—A, Hydrocolloid mixing gun; B, glass graduate; C, 10 cc. Luer syringe; D, empty carpules; E, hydrocolloid; F, 1¼ inches hydrocolloid.

Fig. 2—A, Empty metal-end carpules; B, 10 cc. Luer syringe; C, 19 gauge needle; D, carpule being filled; E, carpules filled with hydrocolloid; F, carpules filled with water.

Fig. 3—A, Carpule filled with formulated hydrocolloid; B, carpule syringe; 19 gauge needle with carpule filled ready for use; C, carpule filled with water for cleaning needle.

Fig. 4—Model showing three types of abutment preparations ready for impression.

Fig. 5—Tray boxed with compound ready for hydrocolloid. A, compound boxing so as to contact tissues; B, rests in compound from 2 to 3 mm. thick; C, compound cut away from abutment teeth to give elasticity of hydrocolloid.

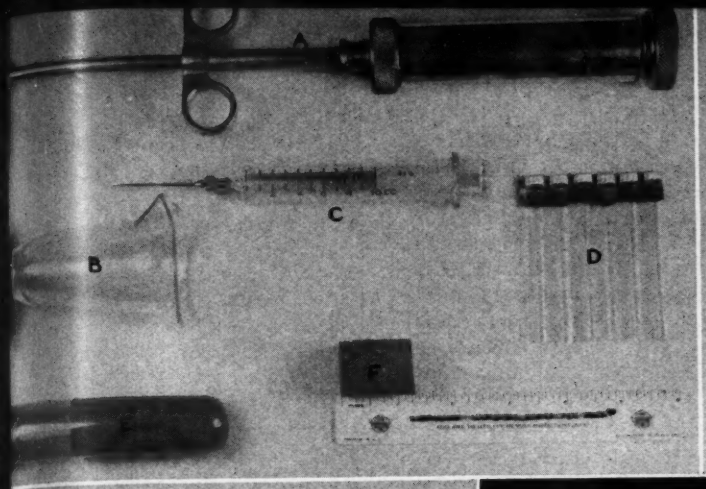
Fig. 6—A, Tray filled with hydrocolloid ready for impression; B, filling of abutment preparations with hydrocolloid by using carpule syringe to prevent air bubbles in final impression.

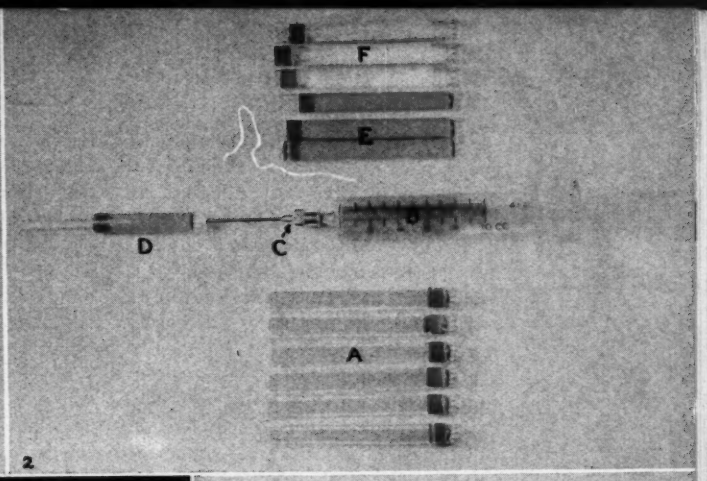
Fig. 7—Impression in place. More time is required for chilling than in partial impression owing to extra depth of cavities.

Fig. 8—Completed impression. Arrow is pointing to pin in gingival of cuspid preparation.

Fig. 9—A, Vibrator (very necessary); B, filling the impressions of prepared teeth with Akratex by using a round blunt instrument to prevent scarring of impression.

Fig. 10—Adding a cone of Akratex to each die to assure enough length for tapering one-fourth inch.





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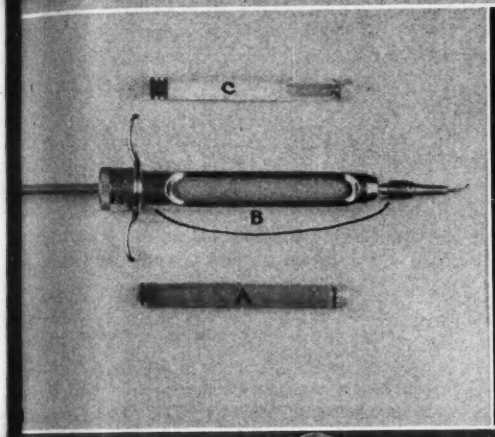

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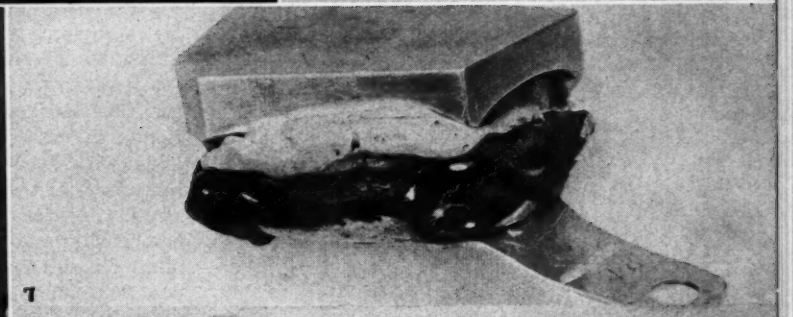

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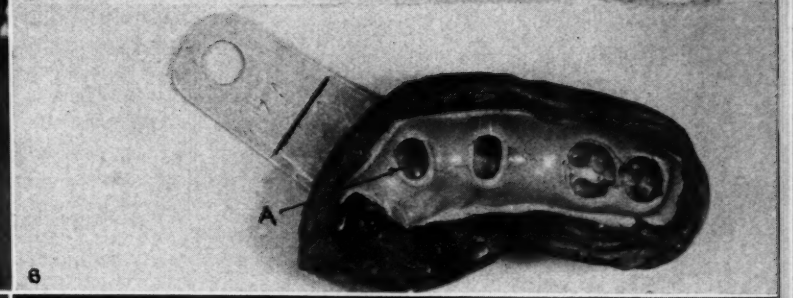

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5. It is important that the gum tissue be packed away from the gingival margin of the cavity and that all blood be eliminated. As is well known, if the gingival margin of the cavities are not free from the gum tissue, it is impossible to secure this margin in any kind of an impression. If a cavity were filled with blood it would also prevent securing an accurate impression. When a hydrocolloid material is used, any blood in the impression will prevent the die from setting accurately. The method of packing away the gum tissue from the gingival margin may be of the operator's choosing, but the use of a round toothpick or small cotton pellet dipped in trichloracetic acid has been found successful.

6. When the margin of the cavities are free from tissue and blood, block off the cheek and tongue with cotton rolls and dry all saliva from the cavities.

7. While this is being done hydrocolloid is prepared as stipulated by the manufacturer, and a carpule is dropped into boiling water for at least one minute as the weakened hydrocolloid in the carpule breaks down more readily.

8. The tray is then partly filled with full strength hydrocolloid, and the carpule is loaded into the syringe.

9. The formulated material from the carpule is ejected, filling the cavity of the tooth or teeth and space between the gum tissue and gingival margin of the cavity. A Mercitan needle is ideal for use with the carpule syringe.

10. When the tray is filled, carry to place and chill at least four minutes.

No great haste is necessary during this impression procedure.

Bite

The importance of a correct bite to secure the proper relationship of the bridge area with the opposing teeth cannot be over-emphasized. A proper amount of care will not only save the operator's time in inserting the inlay or bridge but will increase the patient's confidence because of the minimum adjustment necessary. All occlusal errors should be eliminated in the laboratory on the master cast. The necessity for absolute jaw relationship is therefore evident. It is well to remember that hydrocolloid is used in taking the impression, the cast from which retains all contours, undercuts, and fine detail. It is apparent, then, that it is necessary to use a bite relationship material that has some elasticity and will not be distorted in placement. Trulastic was found to have these requirements.

1. The manipulation of Trulastic is similar to compound, except that more heat is required to make it properly plastic.

2. At the time of securing a bite record, an accurate impression of the opposing teeth should be taken with hydrocolloid.

3. The impression of the opposing teeth is boxed and poured with low-fusing metal, preferably one fusing under 160° F.

4. When full impressions are to be taken and the case is to be mounted on an anatomic articulator, all bite records, in accordance with the dentist's accepted theory of balanced occlusion, should be taken, and the cast mounted as usual.

Laboratory Procedure

The impression and bite are carried to the laboratory. It is best that the dies of the prepared teeth be poured immediately but if time precludes this, then in order to prevent evaporation of the water from the hydrocolloid (which would cause subsequent inaccuracy of the material), it is absolutely necessary that the impression be placed in an air-tight, water-containing humidor. A satisfactory humidor can be made from a cheap fireless cooker with all openings sealed. After having poured the dies, the impression should be replaced in the humidor to prevent the evaporation of water from the hydrocolloid.

Laboratory Equipment

1. Low-fusing metal
2. Akratex
3. Glass slab and spatula
4. Humidor
5. Ney's tapered dowels
6. Plaster bowl and spatula
7. Quick-setting stone
8. Water
9. Crown and bridge cement
10. Amalgam bur
11. Vaseline
12. Camel's hair brush
13. Vibrator
14. Small rounded blunt instrument
15. Air syringe
16. Eye dropper
17. Carding wax
18. Spatulator
19. Articulator

Laboratory Procedure

1. Place the estimated amount of Akratex on a glass slab.

2. Fill a large eye dropper with water and expel several drops on the slab.

3. Incorporate the Akratex in water, adding water and mixing until the mass is similar to a synthetic porcelain mixture.

4. Place the tray with the impression on the vibrator.

5. With a blunt instrument pick up a small amount of the mix.

(*Text continued on page* 234)

Fig. 11—A, Dies removed from impression; B, removing die with a straight pull and no rocking.

Fig. 12—Dies tapered one-fourth inch from gingival ready for cementation. Hole for dowel seat cut with amalgam bur.

Fig. 13—Dowels being cemented in dies; but before cement sets they are placed in position and the dowels are alined with the long axis of the teeth.

Fig. 14—A, Dies seated in position; B, impression boxed, ready for filling by light vibration with stone of a thick creamy consistency.

Fig. 15—Impression poured with stone. Ends of dowels at arrows, and marbles for articulator mounting.

Fig. 16—Model including dies removed from impression. Note: Be sure to soften compound of impression in warm water before separation.

Fig. 17—Trim stone model away from dowel ends (arrows) at least one-fourth inch deep. Remove dies from stone model by tapping on dowel end.

Fig. 18—Model trimmed around die seats to give access to all preparations on dies.

Fig. 19—Covering dowel ends with carding wax to facilitate their removal after mounting on articulator.

Fig. 20—An impression with hydrocolloid of the opposing teeth is advised for opposition detail.

Fig. 21—Ready to pour low-fusing metal, preferably under 160° F. This assures an accurate reproduction of the opposing teeth.

Fig. 22—Pouring of low-fusing metal in the hydrocolloid impression of the opposing teeth.

Fig. 23—A, Paper clips; B, paper clips cut and bent for retention in low-fusing metal; C, embedded in metal for retention of mounting on articulator.

Fig. 24—An accurate model with die alloy of the opposing teeth.

Fig. 25—A definite seat for the die abutments and model by using Trulastic.

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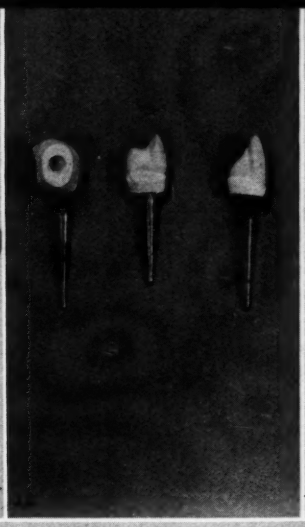
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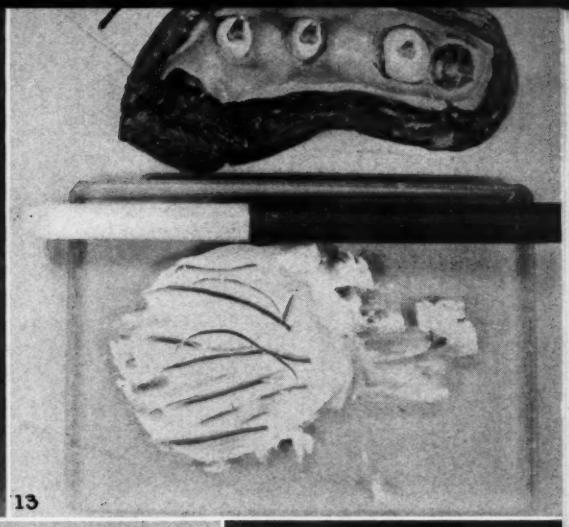
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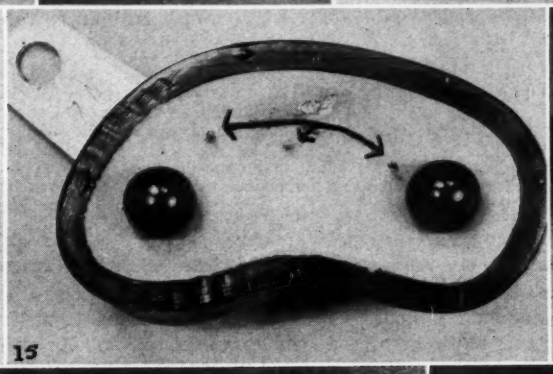
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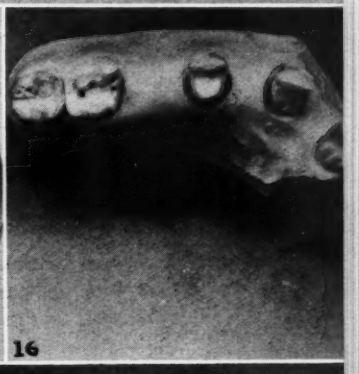
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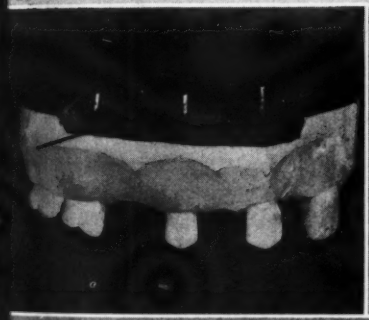
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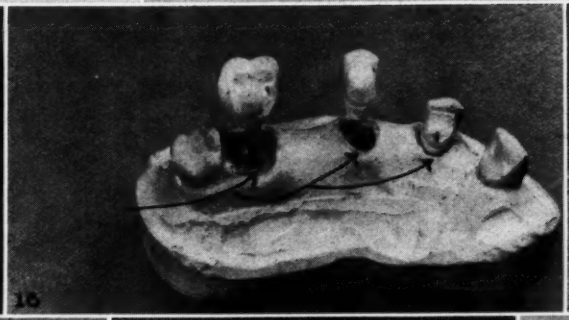
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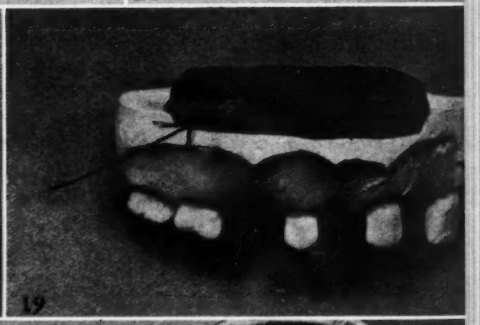
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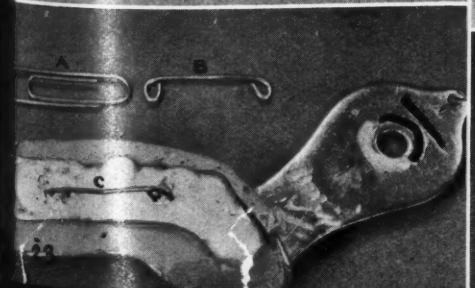

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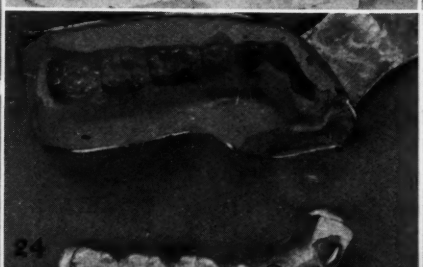
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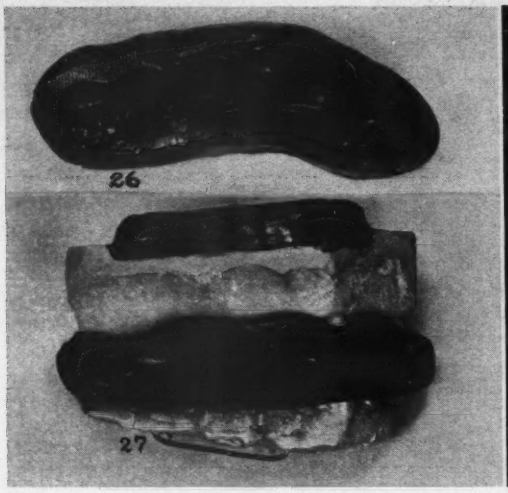


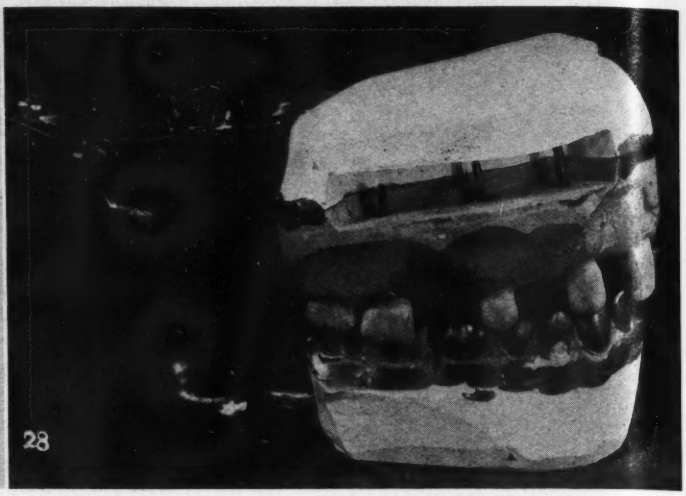


Fig. 26—An accurate seating place for the opposing model of die alloy.
Fig. 27—Model and dies of abutment teeth and opposing die model seated in bite ready for mounting on articulator. Note carding wax covering dowel ends.

Fig. 28—Reproduction of prepared teeth in the mouth and a definite relation to all teeth involved. There are no cheeks, tongue, saliva, blood, or other personal elements to contend with; it should be made easier to construct a bridge under such conditions, sitting at the laboratory bench.

6. Carry the mix to the impression of the prepared teeth only; gently vibrate, adding a small amount of mix until prepared teeth are filled level with gingival of impression.

7. Allow the remaining mix on the slab to set to putty consistency.

8. Divide the mixture on the slab into as many parts as there are prepared teeth; roll into cones; lay over Akratex in impression, and with the spatula, lightly unite the cone to the poured mixture; shape to taper.

9. Place in the humidor and allow to set for thirty minutes.

10. Remove from the humidor and dip the whole impression in warm water for a moment.

11. Remove the Akratex from the impression with a straight pull, without rocking.

12. Replace the impression in the humidor.

13. With a sharp knife, trim the Akratex die of excess material, leaving the anatomy of the tooth tapering only from the gingival. Leave not more than one-fourth of an inch from the crown to the end of the taper.

14. Drill with an amalgam bur one-eighth inch deep in the tapered end of the die.

15. Cement the tapered dowels in the hole; aline with the long axis of the tooth.

16. Paint the die with a thin coat of Akratex die lubricant and allow to dry.

17. Drop the dies into water for two minutes; remove and coat with vaseline.

18. Remove the impression from the humidor; seat the dies into the impression of the prepared teeth.

19. Mix a quick-setting stone to creamy consistency and pour the impression.

20. Allow the stone to make the initial set in about twenty to thirty minutes.

21. Separate and trim the casts; tap the dies at the exposed end of the dowels, and trim the casts to expose all cavity preparations on the dies.

22. With the dies removed, cut the cast around the dowel end one-fourth inch deep and one-eighth inch wide.

23. Place the cast in relation to the metal opposition with a Trulastic bite.

24. With carding wax cover the exposed dowel ends.

25. Mount on the articulator with plaster.

26. Allow the plaster to set.

27. Remove the bite; trim and dig out the carding wax.

Comments

The only satisfactory die material that has been found to date, which can be used with hydrocolloid, is Akratex, an exceedingly fine mesh stone with a minimum of setting dimensional change and perfect adaptability to detail.

The setting time, not less than thirty minutes, is advanced from fifteen or twenty minutes more than the manufacturer allows. The humidor retards the setting time of this material.

The casts aside from the dies may be poured with any of the quick-setting stones. A slightly thinner mix than ordinarily used is best; this reduces setting expansion.

Absolute adherence to the detailed procedure will assure a reproduction of the area to be restored to normal function.

No change in the operator's usual method of tooth preparation is necessary. The manner in which the inlay or bridge is constructed is left to individual discretion. Any type of pontic usually used and the manner of assembly of the bridge need not be changed.

Although this procedure does not advocate a one-piece casting, a number of them have been successfully constructed. Whether the bridge is assembled and soldered or cast in one piece, a cast will be obtained on which to replace the bridge to finish and adjust with all errors visible.

Results are limited only by the skill of the person making the bridge.

Professional Building.

The Buffer Value of the Saliva and Its Relation to Dental Caries 4

MILTON T. HANKE, B.S., Ph.D.,* Chicago

WE WERE ABLE, a few years ago, to demonstrate that diet may be a factor in preventing or in eliminating certain dental diseases. Our thesis[1] was then, and still is, that a diet adequate in all respects is conducive to the health of the oral tissues.

Gingivitis of various kinds is influenced favorably by foods that contain a large amount of vitamin C; and it is probable that vitamin C is the active agent. Dental caries, however, cannot be eliminated in more than about 50 per cent of all cases, even though the diet is adequate in every respect, and there is nothing to indicate that vitamin C is of greater importance in combating this disease than is any other vitamin. There is, in fact, no satisfactory proof that any vitamin is of importance in combating dental caries in susceptible people,[2] although a diet rich in fruits and vegetables is undoubtedly of value in many cases.

Just how, then, does diet exert a favorable influence on the caries process in some cases? This subject has been treated admirably by Doctor Martha Jones.[2] From her comprehensive review of the dietary literature, she concluded that the arrest of incipient caries by diet is due largely to its alkalinizing effect. She concludes her article with the statement, "It may be that there is some unknown factor in fruits and vegetables which is specific for dental caries and that the leafy vegetables are particularly potent in this respect. However, until that factor is discovered, the potential alkalinity of an otherwise adequate diet seems to furnish a dependable guide for the control of dental disease." Her discussion seems to warrant such a conclusion.

If diet is of value in combating dental caries because it contains minerals that increase the alkali reserve of the blood, how does this alkalinizing effect serve to protect the teeth? There are a number of possible explanations; but the simplest is that the saliva will become more alkaline or will be more adequately buffered.

Many articles have been written that deal with the hydrogen ion concentration of saliva; the buffer value of saliva; or the calcium and phosphate content of saliva in relation to the incidence of dental caries. It is impossible, from the literature, to come to any definite conclusions about the facts, because the investigators cannot agree among themselves. We have, therefore, undertaken to make a brief study of the relation of salivary alkalinity to the incidence of dental caries. This study deals with the alkalinity of the saliva of immune persons, nonsusceptible, and susceptible persons, and does not concern itself with the effect of diet on the reaction or buffer value of saliva. It does, nevertheless, suggest why teeth sometimes do not decay; it supplies a simple laboratory technique for determining the susceptibility of a patient to dental caries at a given time, and may prove to be a serviceable method for determining what food or other materials have a favorable action on the saliva.

Experimental Methods

Studies were conducted upon fifty-one persons who have been patients of members of the research group for from one to thirty years. Complete dental records, including roentgenograms, are available for all cases. This eliminates any doubt concerning the diagnosis in any given case.

The patients have been divided into three groups:

1. *Immune to Caries*—We have defined an immune person as one who is not less than 6 years of age, who has never developed a clinical cavity, whose teeth are free from white opaque areas, and whose roentgenograms are negative for caries.

2. *Susceptible to Caries*—A person who has developed new carious lesions during the past year as evidenced by clinical observation and dental roentgenograms would be considered susceptible to caries. Newly-formed, white opaque areas on the teeth, especially along the gum margins, are considered to be evidence of active caries even though a clinical cavity has not formed.

3. *Not Susceptible to Caries*—A person who has developed no new cavities for at least two years as evidenced by clinical observation and dental roentgenograms would not be considered susceptible to caries.

Procedure

Patients are supplied with sterile, 1 ounce screw cap jars that contain O.1 Gm. of parachlormetaxylenol (an efficient, neutral germicide). A flow of saliva is induced by the patient chewing a stick of gum and all the saliva that accumulates is expectorated into the jar until about 25 cc. have been collected. A collection is made *before* breakfast and another exactly one hour after breakfast has been concluded. The mouth has not been rinsed before breakfast nor have the teeth been brushed. These two samples will be referred to as "pre" and "post." The closed jars are vigorously agitated for about two min-

*In collaboration with the members of The Chicago Dental Research Club.

[1]Hanke, M. T.: Diet and Dental Health, University of Chicago Press, 1933. Relation of Diet to Caries and Other Dental Disorders, J. A. D. A. 16:2263 (December) 1929. Relation of Diet to General Health and Particularly to Inflammation of the Oral Tissues and Dental Caries, J. A. D. A. 17:957 (June) 1930. The Rôle of Diet in the Cause, Prevention and Cure of Dental Diseases, J. Nutrition, 3:433-51, 1931. Nutrition and Dental Disorders, D. Survey, 7:23, 7:55 (June and July), 1931. Nutritional Studies on Children. III. The Value of Orange and Lemon Juice in the Control of Dental Caries and Inflammation of the Gums, and as a Stimulus to Body Growth, Int. J. Ortho. 19:642 (June) 1933. Nutritional Studies on Children. IV. Further Observations on Diet as a Factor in Growth and as an Aid in the Control of Gingivitis and Dental Caries, D. Cosmos, 75:933 (October) 1933. Hanke, M. T.: The Chicago Dental Research Club; Needels, Marion S.; Marberg, C. M.; Tucker, W. H.; Ghent, C. L.; Williams, J. M.; Bartholomew, Myrtle D.: Nutritional Studies on Children. II. The Effect upon Dental Caries of Adding Orange and Lemon Juice to the Diet, D. Cosmos, 75:635-48; 739-49 (July and August) 1933.

[2]Jones, Martha R.: Our Changing Concept of an Adequate Diet in Relation to Dental Disease, D. Cosmos, 77:535-49, 651-53 (July) 1935.

TABLE 1—IMMUNE TO DENTAL CARIES

Case Number and Initials	Age	Sex	Period of Observation Years	Pre-Breakfast Saliva			Post-Breakfast Saliva			Diagnosis		Diagnostic Agreement	Special Comments
				pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	ph before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	saliva	clinical		
1—E.W.	7	F.	7	7.1	6.05	1.9	7.15	6.4	2.5	N-S.	I.	Yes	
2—K.W.	26	F.	20	6.8	6.0	2.1	7.05	6.35	2.4	N-S.	I.	Yes	2 children
3—W.B.	60	M.	60	7.15	6.25	2.3	7.2	6.4	2.5	N-S.	I.	Yes	
4—D.P.	8	F.	8	7.4	6.7	3.1	7.4	6.7	3.1	N-S.	I.	Yes	
5—B.M.	8	F.	8	7.5	6.6	2.5	7.5	6.5	2.2	N-S.	I.	Yes	
6—R.B.	14	M.	7	7.15	6.05	1.8	7.15	6.15	1.9	N-S.	I.	Yes	
7—P.R.	7	F.	1	7.4	6.45	2.6	7.5	6.55	2.7	N-S.	I.	Yes	
8—J.W.	16	M.	10	7.25	6.35	2.5	7.4	6.45	2.5	N-S.	I.	Yes	
9—B.P.	12	F.	4	7.0	6.2	2.3	7.15	6.4	2.6	N-S.	I.	Yes	
10—J.M.	13	M.	5	7.1	6.05	2.0	7.1	6.1	2.0	N-S.	I.	Yes	
			Averages:	7.18	6.27	2.3	7.26	6.4	2.4				

* In this table and the others accompanying this article, the symbols indicate the following:
pH, A measure of the hydrogen ion concentration
N/10 HCl, tenth-normal hydrochloric acid
N-S., Nonsusceptible
I., Immune
S., Susceptible
B., Borderline

TABLE 2—NOT SUSCEPTIBLE TO DENTAL CARIES

Case Number and Initials	Age	Sex	Period of Observation Years	Pre-Breakfast Saliva			Post-Breakfast Saliva			Diagnosis		Diagnostic Agreement	Special Comments
				pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	saliva	clinical		
37—C.H.	43	F.	20	7.0	6.0	1.8	7.0	6.0	1.8	N-S.	N-S.	Yes	
38—B.Mc.	9	M.	2	6.8	6.0	2.0	7.0	6.25	2.3	N-S.	N-S.	Yes	
39—M.M.	65	F.	3	6.8	6.0	2.0	6.95	5.95	1.8	N-S.	N-S.	Yes	Has had some impaction caries in fissures.
40—D.W.	9	M.	3	6.8	6.15	1.9	6.8	6.2	2.0	N-S.	N-S.	Yes	
41—A.N.	40	F.	17	6.8	6.1	2.2	7.1	6.25	2.2	N-S.	N-S.	Yes	
42—A.J.	65	M.	45	7.0	6.3	2.5	6.9	6.25	2.0	N-S.	N-S.	Yes	
43—A.F.	65	M.	45	6.6	5.8	2.0	6.9	6.0	2.0	N-S. to B.	N-S.	Yes	
44—M.C.	34	F.	2	6.9	6.0	2.1	7.0	6.1	2.1	N-S. to B.	N-S.	Yes	Pyorrhea
45—F.S.	15	F.	3	6.65	5.5	1.7	6.9	6.15	2.0	Borderline	N-S.	No	All interproximal areas filled. Others kept clean by brushing.
46—Z-1	35	M.	8	6.1	4.9	1.2	6.35	5.35	1.6	S.	N-S.	No	
47—N.N.	45	M.	4	7.0	6.4	3.0	7.1	6.4	2.5	N-S.	N-S.	Yes	
48—S.K.	55	M.	35	6.75	5.9	1.8	6.9	6.1	2.0	N-S.	N-S.	Yes	
			Averages:	6.77	5.92	2.0	6.9	6.1	2.0				

utes to insure sterility, and are then placed in a refrigerator awaiting analysis. Significant changes in the hydrogen ion concentration or buffer value do not occur in the sterilized saliva, even on long standing.

Exactly 10 cc. of the sample is measured into the glass potentiometer reaction cup. An excess of quinhydrone is added and the hydrogen ion concentration determined. Then exactly 1 cc. of tenth-normal hydrochloric acid is added and the hydrogen ion concentration determined again. Finally, tenth-normal hydrochloric acid is added in 0.2 cc. portions until a *p*H of 4.5 is obtained. This gives three values[3]; namely; (1) the initial hydrogen ion concentration; (2) the hydrogen ion concentration produced by adding an amount of acid about equivalent to that which would have developed if the saliva had been incubated for four hours; this is an index of the buffer value of the saliva or its ability to neutralize acid; (3) the approximate end-point of a titration with methyl orange. This is not significant; but generally parallels the second point.

The collection of the samples was carried out by the patients under the instruction and supervision of the dentists. The samples were code-marked and turned over for testing without any identifying mark other than this code number or the initials of the patient. A tentative diagnosis was made from the salivary figures and then compared with a clinical diagnosis supplied by the dentist. In table 1 both diagnoses are given. Sall-

[3]The quinhydrone electrode is not particularly good for the determination of pH values higher than 7.0. Some of the initial pH values are, therefore, probably low.

TABLE 3—SUSCEPTIBLE TO DENTAL CARIES

Case Number and Initials	Age	Sex	Period of Observation Years	Pre-Breakfast Saliva			Post-Breakfast Saliva			Diagnosis		Diagnostic Agreement	Special Comments
				pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	saliva	clinical		
11—M.H.	43	M.	20	6.5	5.0	1.2	7.0	5.8	1.7	S.	S.	Yes	
12—L.B.	56	M.	36	6.75	5.5	1.7	7.0	5.75	1.7	S.	S.	Yes	
13—E.W.	32	F.	15	6.65	5.3	1.5	7.0	6.2	2.2	S.	S.	Yes	
14—B.L.	13	M.	7	7.0	6.3	2.7	7.1	6.4	2.7	N-S.	S.	No	Heavy Plaque deposit on teeth.
15—B.B.	58	F.	30	6.75	5.4	1.5	6.8	5.4	1.5	S.	S.	Yes	
16—L.S.	31	F.	4	6.35	5.3	1.5	6.7	5.8	1.8	S.	S.	Yes	
17—M.	18	F.	1	6.35	5.0	1.2	6.4	5.3	1.4	S.	S.	Yes	
18—A.P.	31	F.	31	6.95	5.4	1.5	7.0	5.5	1.5	S.	S.	Yes	
19—L.McC.	34	F.	34	6.8	5.25	1.5	6.9	5.8	1.8	S.	S.	Yes	
20—M.S.	65	F.	30	6.8	5.6	1.6	7.1	5.9	1.7	S.	S.	Yes	Yes
21—M.J.	58	F.	30	6.65	5.35	1.5	7.1	5.95	1.8	S.	S.	Yes	
22—E.M.	30	M.	15	6.35	5.2	1.6	6.4	5.2	1.6	S.	S.	Yes	
23—R.P.	22	F.	2	6.35	4.5	1.0	6.65	4.5	1.0	S.	S.	Yes	
24—F.Y.	35	F.	6	7.05	5.4	1.5	7.4	5.15	1.3	S.	S.	Yes.	Natural immune until this year.
25—J.B.	17	F.	17	6.65	4.8	1.2	6.6	4.8	1.2	S.	S.	Yes	Pregnant 8 months.
26—N.L.	30	F.	1	6.6	5.0	1.3	6.8	5.3	1.5	S.	S.	Yes	
27—W.	37	F.	2	6.65	5.0	1.3	6.65	5.0	1.3	S.	S.	Yes	
28—H.G.	28	F.	1	6.45	5.25	1.5	6.85	5.9	1.7	S.	S.	Yes	
29—F.F.	15	M.	3	6.6	5.15	1.3	6.8	5.25	1.4	S.	S.	Yes	
30—B.B.	20	M.	20	6.7	5.45	1.5	6.95	5.45	1.5	S.	S.	Yes	
31—J.B.	20	M.	20	6.8	5.15	1.3	6.95	5.5	1.5	S.	S.	Yes	
32—Z 2	18	F.	1	5.8	4.4	1.0	6.35	4.6	1.0	S.	S.	Yes	
33—Z 10	25	F.		7.0	5.1	1.3	6.9	5.0	1.2	S.	S.	Yes	
34—H.D.	61	M.	30	6.3	4.5	1.0	6.3	4.5	1.0	S.	S.	Yes	
35—E.W.				6.5	4.8	1.2	6.6	4.8	1.2	S.	S.	Yes	
36—B.S.	19	F.	1	6.7	5.2	1.4	7.0	5.5	1.5	S.	S.	Yes	
Averages:				6.62	5.17	1.4	6.81	5.4	1.5				

TABLE 4—PERIODICALLY SUSCEPTIBLE BORDERLINE

Case Number and Initials	Age	Sex	Period of Observation Years	Pre-Breakfast Saliva			Post-Breakfast Saliva			Diagnosis		Diagnostic Agreement	Special Comments
				pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	pH before	pH after adding 1 cc. N/10 HCl	cc. N/10 acid required to reduce pH to 4.5	saliva	clinical		
49—B.C.	9	M.	1	6.7	5.85	1.7	7.2	6.32	2.2	B.	B.	Yes	Seldom any decay
50—M.G.	50	F.	10	6.75	5.85	2.3	7.0	6.25	2.3	N-S. to B.	B.	Yes	Seldom any decay
51—M.B.	33	M.	6	6.85	5.75	1.9	7.0	5.75	1.9	B.	B.	Yes	Seldom any decay

vary diagnoses were made as nonsusceptible, susceptible, and borderline (or doubtful). It is apparent that "nonsusceptible" saliva might belong either to an immune or to a nonsusceptible person.

The detailed results for the first fifty-one cases are reproduced here in tables 1, 2, 3, and 4.

Discussion of Results

Immunes—The saliva of immune persons is characterized by being neutral or slightly alkaline at all times. The one exception was in Case 2. The addition of 1 cc. of tenth-normal hydrochloric acid to 10 cc. of saliva does not depress the pH below 6.0 in any case (average 6.27) even with the pre-breakfast samples. The post-breakfast samples are even somewhat more highly buffered.

The saliva of people immune to dental caries is capable of neutralizing considerable acid before the hydrogen ion concentration is lowered to the point at which enamel can be dissolved.

Susceptibles—The early morning, pre-breakfast saliva of people susceptible to dental caries is characterized usually by being acid in reaction (average pH 6.6) and by having little ability to neutralize acid. Thus the addition of 1 cc. of tenth-normal hydrochloric acid to 10 cc. saliva de-

pressed the *pH* to an average of 5.17 with a minimum depression to 5.6 and a maximum to 4.4. Our conclusion is that, as a general rule, *any human pre-breakfast saliva, of which 10 cc. shows a hydrogen ion concentration depression to 5.6 or below when treated with 1 cc. of tenth-normal hydrochloric acid comes from a person susceptible to dental caries.* The post-breakfast samples are not so definitely characterized. In case 2, for example, the patient, who has supplied several hundred samples of saliva, invariably excretes a neutral or alkaline saliva throughout the day, (especially shortly after meals) which may, at times, be as well buffered as that from an immune person; but the pre-breakfast sample is always acid in reaction and poorly buffered.

It was determined that to be of any diagnostic significance, the pre-breakfast sample must be collected before ten o'clock in the morning, because those collected later may be neutral or alkaline and well buffered even though nothing has been eaten. Samples collected before eight o'clock in the morning usually were found to be more acid and more poorly buffered than those collected later, and the ingestion of an early breakfast does not seem to stimulate the secretion of a more highly buffered saliva.

The pre-breakfast saliva of people susceptible to dental caries is poorly buffered, so that very little acid is required to lower the hydrogen ion concentration to a value that is dangerous to enamel.

In case 14 the salivary and clinical diagnosis did not agree. This patient is a boy whose teeth were heavily covered with plaques, and it is entirely conceivable that this coating was so thick that the well-buffered saliva could not penetrate through it to the enamel surface.

Nonsusceptibles—The saliva of nonsusceptible persons is similar to that of the immunes in that it is fairly well buffered. The initial *pH* of the pre-breakfast sample is usually not so high as that of samples from immune persons (average 6.77); but the addition of 1 cc. of tenth-normal hydrochloric acid seldom depressed the *pH* of the 10 cc. sample below 6.0.

The salivary diagnosis did not agree with the clinical observation in cases 45 and 46. We can offer no explanation for the disagreement in case 45. Case 46 is that of a dental technician who has had no decay for several years. The dental restorations are, however, so numerous that they virtually preclude the possibility of approximal and occlusal caries and the other surfaces of the teeth are kept clean by brushing. This patient is probably still susceptible to caries, although owing to mechanical reasons, he may not ever develop new cavities.

TABLE 5—PRODUCTION OF ACIDITY IN HUMAN SALIVA

Case Number	Pre-Breakfast Saliva			Post-Breakfast Saliva			Clinical Diagnosis
	Before Incubation *pH*	After Incubation *pH*	cc. N/10 Acid required to reduce the *pH* of the original saliva to that in Column 3	Before Incubation *pH*	After Incubation *pH*	cc. N/10 Acid required to reduce the *pH* of the original saliva to that in Column 6	
3—W.B.	7.15	4.75	2.2	7.2	5.9	1.5	I.
4—D.P.	7.4	6.0	2.2	7.4	6.85	.8	I.
5—B.M.	7.5	5.35	2.2	7.5	6.45	1.0	I.
37—C.H.	7.0	4.7	1.6	7.0	5.80	1.2	N-S.
51—M.B.	6.85	4.7	1.8	7.0	4.9	1.7	B.
11—M.H.	6.5	4.8	1.4	7.0	5.2	1.4	S.
12—L.B.	6.75	4.6	1.5	7.0	5.6	1.1	S.
23—R.P.	6.35	4.5	1.1	6.65	4.8	.8	S.
24—F.Y.	7.05	4.8	1.2	7.4	4.9	1.1	S.
18—A.P.	6.95	4.7	1.4	7.0	4.8	1.3	S.

Comments

The conclusions we have drawn from these observations are:

1. One is *immune* to dental caries partly because of the excretion *at all times* of a saliva that is alkaline and highly buffered; hence, capable of neutralizing the acids produced by bacteria, and thus preventing the development of a sufficient degree of acidity to injure enamel.

2. One is *susceptible* to dental caries partly because of the excretion of saliva, *especially at night*, which is poorly buffered and hence incapable of neutralizing very much acid. Because of this, acids produced by bacteria in regions of stagnation in the mouth are not neutralized sufficiently; therefore, the enamel is slowly dissolved.

Rate of Production of Acid by Oral Bacteria

There is still a tendency on the part of certain investigators to attribute all the decalcification that occurs in dental caries to acids produced by some specific micro-organism. It is true that certain bacteria may play a major rôle in acid production at some stage of the decalcification process; but this is relatively unimportant. It is a fact that all mouths contain bacteria capable of producing acid from dextrose, and further investigation was carried out to determine the rate at which this acidity develops, and the effect of the salivary buffers in controlling the reaction of the medium. The mere production of acids can be of no importance in dental caries if the acids are promptly and efficiently neutralized. In this work similar samples were collected in a similar manner except that no germicide was mixed with the saliva.

Collection and Treatment of Samples

The patient chews a piece of gum as before, and expectorates the saliva into a sterile, 30 cc. screw-cap jar until about 25 cc. have been collected. The sample is divided into two approximately equal parts. One-half is incubated for four hours. The other half is now treated with a germicide (usually an excess of parachlormetaxylenol or 7 drops of a 1:1000 solution of tolyl mercuric nitrate in glycol), and set aside in a refrigerator.

(*Continued on page* 252)

The Editor's Page

IN AN ARTICLE by Doctor Straith in this issue, he says, "Fistulous tracts and sinuses with external openings on the face or neck are observed by both physicians and dentists." He might have added that many of these fistulous tracts and sinuses are the result of negligence on the part of some physician or dentist. In that twilight zone between medicine and dentistry the acute alveolar abscess occupies an important place. Frequently the patient who suffers from this condition is shuttled back and forth between physician and dentist. Although the disturbance in its beginning was probably of dental origin, the result of the death of the pulp, often when the swelling occurs the dental symptoms have abated. The patient is then concerned with the swollen face, for which he sometimes turns for aid, not to the dentist, but to the physician. The physician may direct the patient back to the dentist with the instruction to remove the offending tooth. The dentist objects, and an impasse develops. While the debate wages between the dentist and physician, the swelling grows more extensive; that shiny drum-like characteristic of the tissue develops; the patient becomes more toxic and uncomfortable. Nature cannot tolerate such indecision for a long period: A spontaneous rupture occurs; pus begins to drain in the face; a fistula is formed; an unsightly scar will probably develop; and thus the patient is prepared for either disfigurement or a subsequent plastic repair.

Better advice cannot be found for the treatment of acute dental alveolar abscesses than that given by Blair and Ivy[1]: First they insist that this type of abscess should be treated as any other; that is, prompt and proper drainage must be instituted. Before frank suppuration occurs, it is unwise to attempt to point the abscess by the use of poultices or heat. Such external treatments tend to increase the inflammatory processes and encourage the abscess to point toward the face. These authors believe that cold, moist applications of saturated solution of magnesium sulphate or boric acid in alcohol are more suitable in the preliminary stages. In the case of fully developed acute abscesses, Blair warns against the extraction of a tooth until the acute symptoms have subsided. Abscesses from the lower teeth, pointing externally, should be incised and drained before they break down and rupture. Incision of the skin is best done under nitrous oxide-oxygen anesthesia.

Incision, according to Blair, must be done with these facts in mind:

1. The abscess should be incised at its most dependent point.
2. The incision must be large enough for the free flow of pus, but not unnecessarily large.
3. The incision should follow the natural contours of the face and lines of the skin; it should be so placed, if possible, as to be concealed by the shadow of the lower jaw.
4. The incision should be planned to avoid important structures, such as the facial artery and nerve.
5. Blair warns, particularly, that incisions above the lower border of the mandible should be avoided, if possible.

Not all swellings of the face are of acute infectious origin. Dentists or physicians should not be too quick to draw with their knives. The swelling of the jaw may indicate a tuberculous abscess, for example. It could be a swelling associated with a blood dyscrasia. It could be a gumma.

The point emphasized is that dentists should prepare themselves to evaluate the various forms of swellings associated with the jaw and to know how to discriminate among them. Once the swelling is evaluated and a diagnosis is made, dentists should be prepared to institute complete treatment. To be sure, cooperation between physician and dentist is fundamental and necessary; but so far as oral surgery procedures are concerned, the dentist should be ready to see the case through from the first symptom. The twilight zone between medicine and dentistry should be taken over by dentists. Physicians have too many other fields to cover. This territory, however, cannot be acquired by mere occupancy. It must be a conquest gained by knowledge and demonstration of ability.

[1]Blair, V. P. and Ivy, R. H.: Essentials of Oral Surgery, Second Edition, St. Louis, The C. V. Mosby Company, 1936, page 204.

What Twelve Hundred Patients Know About Dentistry*

PART V

11. *Are Crooked Teeth and Poorly Developed Jaws in Children Something That They "Outgrow?" What Are Your Opinions?*—Again we must be impressed with the accuracy of the information that the public has on this subject; likewise with its attitude on the correction of malocclusions. Almost everyone believes that orthodontia is advisable in indicated cases.

12. *What Do You Think Brings About the Need for Artificial Teeth? Do You Think It Is "Just One of Those Things" That Comes with Advanced Age?*—We attempted to determine whether people considered the need for dentures as an expression of the aging process. We wondered whether people considered the loss of teeth as inevitable—in the same category as graying or loss of hair. In none of the questions were the answers so dramatically interesting as in this one. Patients for the most part believe that *loss of teeth is occasioned by neglect and improper care and fear.* Only twenty-three persons indicated their belief in the inevitability of dentures. If, as the response to this question reflects, the appreciation of the public is so fine and the value of preventive measures and early and constant dental care is acknowledged, we have every reason to be hopeful. The further promotion of this preventive point of view should be the motive of any educational undertaking.

REMARKS

The following unedited excerpts are typical of the remarks made by those answering the questions in the survey:

1. The public is so "over-propagandized" by matters pertaining to physical health that the "quack" has great opportunities for gulling—Professional men have entered into this so far that real ethics of medicine is a thing of the past. Dentists and medical men generally seem to have banded together through various "associations" not so much for the public welfare as to protect one another against criticism and to advance their own importance and pecuniary welfare.

This is unfortunate in a group so necessary to the people as a whole. More time should be spent in research and in the exposing of fake and charlatan—Instead of the attempt to limit the number of professional men by high cost of their education—this should be made the most accessible of knowledge as it concerns life itself and its enjoyment. There are other remarks which I could make.

2. Do I think the average price of dentistry excessive? Yes, for the reason it is beyond the reach of the average family to have their children's teeth properly cared for, and unnecessary on part of the dentist.

3. I only wish that very early in life I had been instructed and forced to care for my teeth properly and regularly. Any education that can be given to parents so that they will enforce such a thing would be commendable.

4. I have felt for a long time that the greatest problem in dentistry as well as in its sister science, medicine, is to find a way to make dental care and medical care accessible to the great mass of the people. Today, because of economic conditions, such adequate care is practically beyond the reach of the great majority. Being the wife of a physician I naturally see the problem from both sides, that of the dentist or the physician as well as that of the patient. There has to be a limit to their charity work. Yet in spite of the great strides made in both professions, I feel that never before has there been such unfortunate neglect of proper health measures on the part of individuals.

5. Proper dental education is appreciated by the intelligent patient. Probably more complete knowledge would give one a more objective point of view and thus lessen a great deal of the dread connected with dentistry.

6. To whom it may concern: I am not a very good person to answer these questions because of dental inexperience. I'm ashamed to admit, but from the age of eight, when my Mother died until eighteen when I spent a year in boarding school, I didn't own a toothbrush. Now at thirty-eight and the Mother of six children, I still have a perfect set of teeth; that is, according to my dentist (for cleaning purposes only).

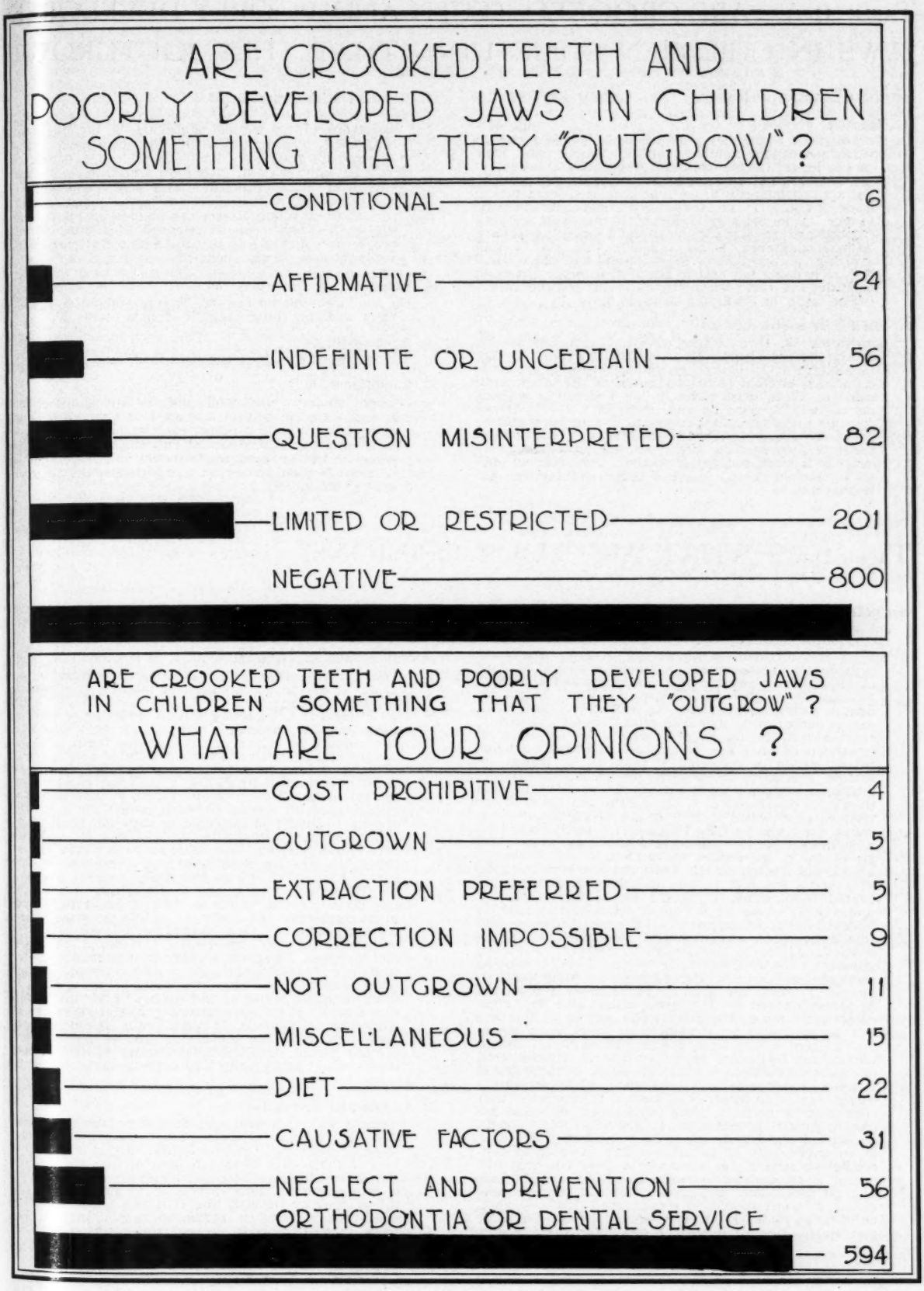
7. To my judgment and learning of many cases, where the dentist advises having the teeth extracted and having plates, seems to me, the majority of the patients have their teeth extracted just for the dentist to make money; to fit them with plates and the patients with plates regretting ever after for being foolish enough to have them extracted. Thank goodness I have my own teeth.

8. Although I speak for myself, I believe thousands of people, occasional and potential patients, do not frequent the dentists for two prime reasons. First is the tremendous cost to those who need frequent treatments such as myself, and secondly because of fear which of course can sometimes be justified. I mean the inevitable cases which are many.

In addition the first reason I realize the average understanding dentist does not charge any more than he has to, but the masses to which I belong, our meagre earnings prohibit proper dental care which is only ONE of the many urgent things we need, and there is four of us in my family.

9. The dental profession can do more for mankind than any other: Giving information to the public through the printed word. A national magazine of general appeal with the importance of dental hygiene presented in frequent articles in various angles of approach. First things first. One thing at a time. The most important thing in life is to have and keep good teeth. Good teeth that you may have good health. Good health that you may develop a capable, poised, alert mind. Publish a magazine at cost to every dentist in America. Have it on every waiting room table of every dental office, doctors waiting rooms, schools, etc. Offer prizes. Steer clear of so-called advertising agencies, have your own. (under trade name). Conduct contests. M.D.'s and dentists

*A study conducted by the Editorial Staff of THE DENTAL DIGEST in cooperation with thirty-seven practicing dentists whose names were listed in the first installment of this report in the January issue. The report is concluded in this issue.



Top: CHART 11-A Bottom: CHART 11-B

TABLE 11-A—ARE CROOKED TEETH AND POORLY DEVELOPED JAWS IN CHILDREN SOMETHING THAT THEY "OUTGROW"?

ORIGINAL CLASSIFICATIONS: 58 **TOTAL REPLIES: 1169**

1. **Negative: 800**
   No, 786; no, I think they grow worse, 1; not as a rule, 2; it is a permanent injury, 1; no, they usually leave their marks in the facial contours of growing children, 1; from observation, I do not believe so, 1; slightly possible, but not satisfactorily, 2; teeth or jaws need correction to grow straight, 1; no, they push them out with the tongue, 1; no, see a good doctor, 1; my teeth are very crooked and are just coming in but I am going to have them straightened, 1; no, I believe that man is still evolving, or progressing in evolution and that Dame Nature is doing her best to adapt him to the changing conditions of this planet. Naturally she is experimenting on teeth, or modifying them, 1; never, 1.

2. **Limited or Restricted: 201**
   Sometimes, 83; to a certain extent, 6; not usually, 25; rarely, 35; not always, 31; to a certain extent, 6; may be outgrown, 1; nature sometimes corrects them, 1; sometimes crooked teeth straighten as the other teeth come in, 2; in most cases, 2; not necessarily without dental help, 2; some do and some don't, 1; yes, if not too extreme, 1; no, most cases are formed through improper breathing and feeding in infancy, 1; not crooked teeth, but perhaps the jaws may develop, 1; they may outgrow it some, but not altogether, 1; babies can outgrow crooked teeth; but not older children, 1; not necessarily, 1.

3. **Question Misinterpreted: 82**
   Yes, if taken care of, 7; yes, with correct diet and dental assistance, 13; not without dental aid, 49; no, unless care is given, 1; in some cases, with help of a good dentist, 2; some do and some don't—should see a dentist, 1; may be outgrown with attention and care, 3; if taken care of in time, 1; often to a large degree depending on the cause and degree of crookedness, 1; yes, if taken care of when young. Braces can be used and if jaws are too small a tooth can be removed, 1; I imagine with proper care a child's teeth can be helped, 1; not necessarily without dental help, 2.

4. **Indefinite or Uncertain: 56**
   Do not know, 28; no answer, 23; yes and no, 4; I don't know a damn thing about it—I have none, 1.

5. **Affirmative: 24**
   Yes, 23; yes, if they have the right food, 1.

6. **Conditional: 6**
   Depends on position of teeth and size and shape of jaw, 1; yes, with the help of a dentist, 1; that all depends on how bad it is, 1; if proper exercises are started at an early age they can be almost entirely overcome, 1; depends on what causes them—should be straightened, 1; if they are given room and watched carefully they will usually straighten, 1.

TABLE 11-B—WHAT ARE YOUR OPINIONS?

ORIGINAL CLASSIFICATIONS: 170 **TOTAL REPLIES: 752**

1. **Orthodontia or Dental Service: 594**
   Should be corrected (straightened) (early), 234; early orthodontia necessary, 66; should have braces, 39; take child to dentist regularly, 32; early treatment helpful, 10; can be straightened, 12; consult a good dentist, 69; dental assistance required, 9; with care, some of it can be outgrown, 1; should be pulled or straightened, 2; constant treatments help, 6; should be threaded, 1; treatment of some use, 1; mechanical correction helpful, 5; should be corrected, if possible, 14; dental attention necessary, 13; I have braces on my boy, 1; might be overcome by treatment, 1; all crooked teeth should be straightened, 1; early care and training are vital to good teeth, 1; if they are straightened when young they will be OK, 1; children's teeth should be straightened because they are a handicap when child grows up, 3; the earlier the correction the better, 1; braces will straighten the teeth but not much can be done about the jaw, 1; can be helped by patient and dentist cooperating, 1; should be helped to develop properly, 5; 99 out of 100 times orthodontists have to help nature, 1; affect good health and appearance and should be cared for early and constantly, 2; family dentist's advice is invaluable, 1; believe in guided growth of teeth from early stage, 1; they can be straightened, 2; jaw structure must sometimes be altered, 1; these are inherent weaknesses and should be properly cared for, 1; parents should give their children's teeth more attention, 1; the contour of the face can be controlled by straightening teeth when young and prevent decay from overlapping teeth, 1; dental and dietary assistance needed in care of crooked teeth and poorly developed jaws, 1; should be straightened if possible, 2; should be straightened while growing—easier then, 2; in majority of cases it is imperative that correction be made, 1; baby teeth should be cared for and irregularities tended to, 1; individual cases should be studied and cared for, 1; the condition referred to is an irregularity of nature needing mechanical correction—a case of "as the twig is bent, the tree will grow," 1; crooked teeth should always be straightened, 4; good dental care and proper diet will improve condition, 2; teeth should be straightened, but not when child is too young, 1; playing some of the wind musical instruments has a tendency to straighten them. Sometimes a dentist's care is necessary, 1; I would not want my children to run the risk—a set of even teeth constitutes a real asset to personality, 1; nothing but expert workmanship will correct these faults, 1; dental surgery necessary in most cases, 1; should be cared for and straightened as soon as apparent deformity appears, 1; should be corrected in infancy, 1; when obviously not correcting itself, treatment should follow to correct, 1; a bent tree usually straightens some by itself, but the gardener could help, 1; they should be straightened to reduce the chance for tooth decay, 1; see the best dentist you know, 1; children's teeth should be cared for in infancy, 2; care of children's teeth is more important than adults, 1; in some cases a dentist can help the teeth to straighten, 1; they should be straightened, 6; should be straightened for looks and speech, 1; should be corrected as they will be a handicap to child, 1; should be straightened by a dentist who knows *how* but they seem to be few and far between, 1; take no chance, have it corrected, 1; take care of them when the six year molar appears, 1; should be x-rayed at an early age to determine, 1; a dentist can do everything to shape the jaw properly by care in straightening the teeth, 1; should be straightened for appearance, 1; teeth should be x-rayed every few months and see an orthodontist, 1; I would see a dentist in whom I had confidence, 1; if corrected at the right age the teeth and jaw can be corrected, 1; first teeth need as much care as second, in my opinion, in order to insure better second teeth, 1; early and expert care that a competent dentist can give, 1; they can be helped by orthodontia, 1; these teeth should be carefully checked in the beginning. This is the most important period, 1; should be checked by dentist and physician, 1; expert effort to correct any such conditions, 1.

2. **Neglect and Prevention: 56**
   Deformity increases with age, 29; causes facial disfiguration, 2; crooked teeth can affect permanent second teeth, 2; don't wait too long to take care of it, 1; should be well taken care of and in time, 4; they need attention while child is young and bones are still pliable, 1; it is a crime for such defects to be neglected—spoils the personality through life, 1; if this is not corrected when young it often spoils the appearance of the teeth, 1; once crooked—always crooked—if left alone, 1;

if children were taken to the dentist while young and had their baby teeth taken care of there would be a lot less orthodontia work to do, 1; malocclusion impairs the condition of the teeth, 1; do all you can to remedy these conditions in babyhood for they are the foundations for the second teeth, 1; must be taken care of while young—delay might be fatal as a disfigurement, 1; most things when growing in a wrong direction encroach upon and disfigure or harm others and this should apply especially to teeth whose relative positions are so important, 1; most cases become worse, 1; I believe if the proper precautionary measures are taken early enough, they can be successfully avoided, 1; early care will prevent or correct, 1; prevention is better than correction, 1; should be watched carefully, 1; remove the first teeth so as the second will grow straight, 1; lack of attention is pitiful, 1; the sooner it is tended to the easier the parent's conscience ought to be, 1; these deformities have bad effect on health and progress as well, 1.

3. **Causative Factors: 31**

No idea of cause, 1; natural deformity, 2; caused by early loss of baby teeth, 1; they sometimes are naturally grown that way, 1; teeth are set too close together, 1; I believe in heredity, 9; should be x-rayed to see real cause, 1; due to poor treatment in some cases, 2; this tendency is inherited, 1; caused by crowding of teeth, 1; due to pre-natal neglect, 1; poorly developed jaws caused by rickets, 1; caused by pre-natal malnutrition, 1; caused by bad tonsils or adenoids causing difficult breathing, 1; sometimes the child is underdeveloped, 1; sometimes caused by thumb-sucking in babyhood, poor health in early childhood, malnutrition, 1; it is the cause of the parents, 1; due to undernourished mother and carelessness in child's diet, 1; due to not getting the temporary teeth out in time, 1; children in poor health often grow crooked teeth, 1; you may straighten them but they will be transmitted again crooked. Look at the Roosevelt clan, 1.

4. **Diet: 22**

Proper foods help, 7; caused by poor diet, 3; right food develops jaws, 1; mother should watch diet during pregnancy, 5; child's diet should be watched, 2; a good diet would help the jaws but wouldn't straighten teeth, 1; proper diet would have stopped it in the first place, 1; caused by malnutrition, 1; due to undernourished mother and carelessness in child's diet, 1.

5. **Miscellaneous: 15**

Defect of structure, 1; cites example of defective teeth of prominent people, 1; same as crooked limb, 2; I think it is best for the child's health, 1; if they could be outgrown why are there so many crooked teeth in adults, 1; cases of restricted sinuses should always be corrected, 1; children's jaws and temporary teeth are the structures from which adult jaws and teeth grow. A poor beginning is a handicap, 1; my teeth grew crooked in front and formed gum boils, 1; the mouth structure is determined prenatally and in early years, 1; poorly developed teeth are better than artificial teeth, 1; they are poorly developed, 1; dependent on age, 1; "some is and some ain't," 1; depends on the teeth, 1.

6. **Not Outgrown: 11**

Can be corrected but not outgrown, 7; can be corrected when young but not when grown, 1; poorly developed jaws are not outgrown, 1; I have some crooked teeth that I did not outgrow, 1; should be taken care of or they will never be good, 1.

7. **Correction Impossible: 9**

Jaws form permanently early in life, 2; such deformities cannot be corrected, 2; thumb-sucking deforms a jaw so it can never be corrected, 2; it doesn't do any good to straighten them, 1; the jaws frequently are disarranged for life, 1; you have them always, 1.

8. **Extraction Preferred: 5**

Extremely crooked ones need pulling, 1; pull the teeth so they will be straight, 1; they might as well be pulled, 1; remove the teeth as soon as they are loose, 1; pulling out crooked teeth allows the others to straighten, 1.

9. **Outgrown: 5**

Jaws develop better as body grows, 1; sometimes crooked teeth straighten as one grows up and the jaw develops, 1; I have seen some teeth straighten up, 1; a slight lack of alinement can sometimes take care of itself, 1; if teeth are not too crooked, there is some chance they will straighten, 1.

10. **Cost Prohibitive: 4**

Consult special corrective dentist if you can afford the price, 1; a high priced but poor orthodontist is worse than letting nature take its course, 1; condition can be partly, if not wholly, corrected by the dentist. *Cost* is an objection, 1; if financially able, all children should have their teeth straightened. The charge for this class of work is a "Racket," 1.

should work together nationally to the same end to make the people health conscious.

10. With regard to question 9 it seems to me that about all a toothpaste can be expected to do is help polish up a bit after the actual spade work of removing the film has been done by the brush.

11. A good dentist is one of one's best friends. I have been fortunate in having dentists who are careful, gentle, and thorough in their work. One does so appreciate gentleness, because it is not a pleasant business at best—visiting the dentist. Also one does appreciate an immaculate office and a dentist who is careful to be immaculately clean, himself.

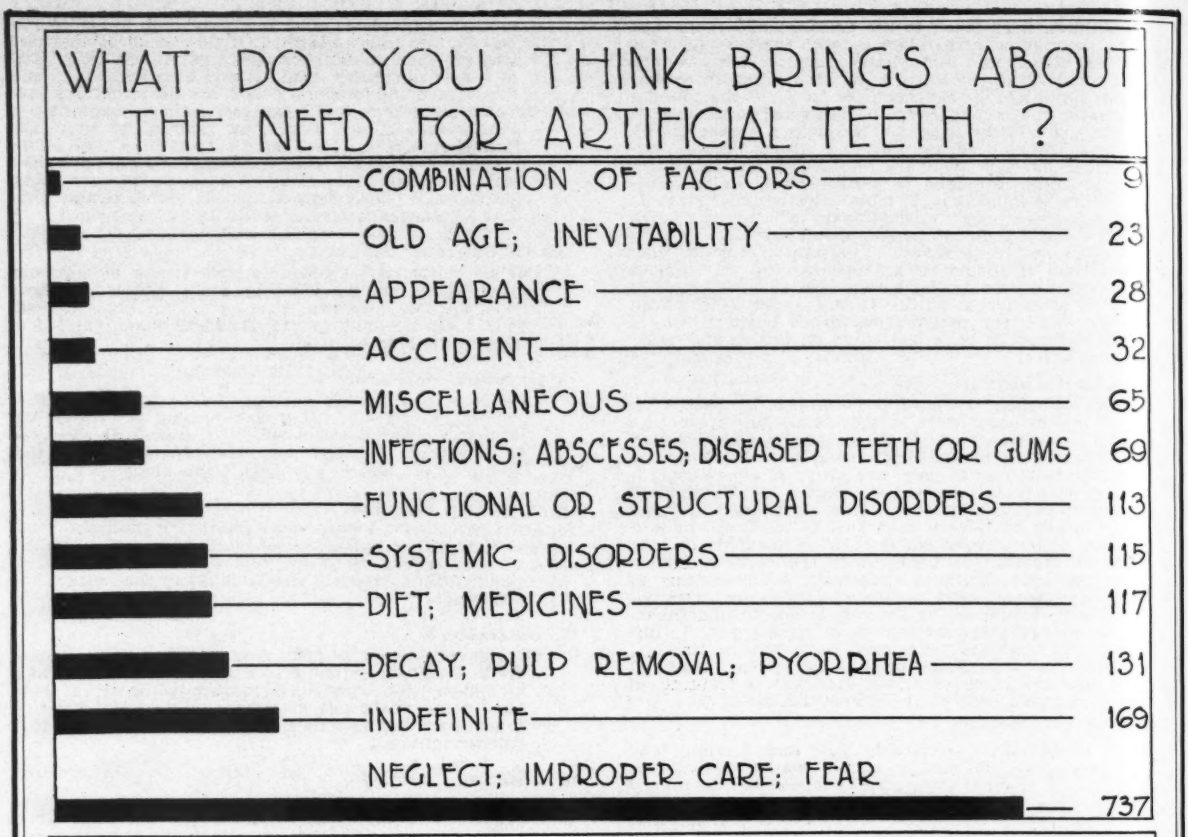
12. *All* dentists would be busy *all* of the time if the charges were lower as no one would neglect their teeth if charges were reasonable. All through the depression I failed to go to the dentist and now I am having 10 or 12 teeth filled. Why should a dentist charge $2.00 for a few minutes treatment (no filling) 50c a treatment of gums would be a good price. The dentists excuse is cost of tools, etc. and electrical equipment and time to learn to be a good dentist. That's no different than being a good farmer or any other trade. We have one piece of machinery on our farm that cost more than all the equipment a dentist ever has. As for learning, a farmer is never through learning. He learns as long as he lives and to top it all off he must fight all the elements to raise a crop, and then when he is ready to sell his crops he can't ask his price—he must take what the dealers want to give him. You asked for remarks. Here they are.

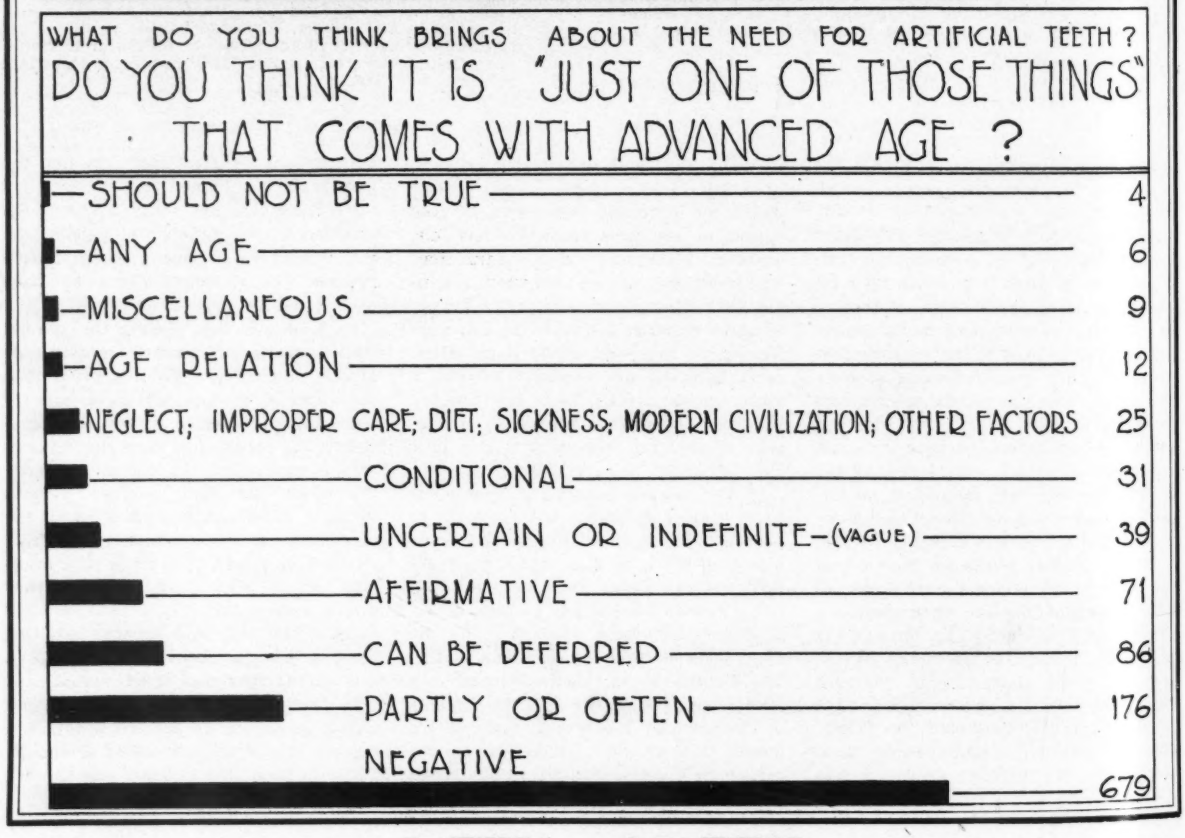
13. No remarks excepting that dentistry should be placed within reach of poor as well as rich. How many people lose their teeth because they cannot afford to have them cared for. A tooth filling represents one day or two—or 3—of labor—for them and it can't be done with children to feed and clothe. The Dentist works 15 minutes and says "Come back tomorrow," with no thought of the precious fifteen or 20 cents of his money the poor man has to give up for carfare or gasoline that would buy bread or soupbone or stockings. I'm not the poor man, but I know lots of 'em.

14. These last few years, I have been appalled by the number of people who are unmistakably losing their health because they cannot *afford* to have needed dental work done.

15. I believe that during the annual teeth examination which most grade school children are given a great deal of influence toward the right care of teeth could be exerted. In my own experience, the dentist has lined the children up and gone down the line merely writing down the main cavities without saying a word to the children about the seriousness of keeping their teeth clean. Often have I heard the little boys bragging about their cavities—that they didn't want a sissy "O.K." pin. A vivid story of the pain and expense resulting from neglect of teeth would make a favorable impression upon many.

16. Dentists hurt like hell and I don't like to go to one so as a consequence I neglect my teeth more than I should. I respect their skill in being able to work





Top: CHART 12-A **Bottom: CHART 12-B**

TABLE 12-A—WHAT DO YOU THINK BRINGS ABOUT THE NEED FOR ARTIFICIAL TEETH?

ORIGINAL CLASSIFICATIONS: 208 TOTAL REPLIES: 1608

1. **Neglect; Improper Care, Fear: 737**
   Neglect, 453; misuse, 3; prenatal neglect, 4; lack of attention, 28; ignorance, 2; improper cleansing, 16; lack of knowledge in caring for one's own, 1; never seeing a doctor, 1; sometimes poor dentistry, 22; lack of care and proper education, 1; might never be needed if permanent teeth are well taken care of, 2; inability of some dentists to care for teeth, 2; improper care of teeth, 78; lack of dental care, 37; good care will help keep even soft teeth in shape, 1; neglect of dental visits every 6 months (regularly) 26; lack of proper care in childhood, 16; delay in dental attention, 4; pre-natal neglect, 2; poor dental diagnosis, 1; poor dental work at beginning of decay, 2; carelessness or ignorance of proper care of teeth, 1; fear and lack of knowledge, 1; not caring for your own teeth regularly enough, 1; the horror of a dental office, 1; lack of dental care and no cooperation from patient, 1; carelessness, 21; improper care of baby teeth, 1; poor care and improper instruction by inexperienced dentists, 1; not treating our real teeth as we should, 1; ignorance of the care of teeth, 1; natural teeth can be retained throughout life if all necessary dental work is done in due time, 1; poor orthodontia (in my own case) 1; poor care of original teeth, 1; I don't think we should ever need false teeth if we could tell a bootleg dentist from a real one, 1; neglect of teeth during earlier periods of life, 1.

2. **Indefinite: 169**
   No answer, 43; loss of original teeth, 20; no answer, 10; loss of second teeth, 57; necessity, 12; extraction, 13, when you haven't any teeth, 1; it mixes the food better, is better for health, 1; I think they are wonderful, 1; good, 1; I do not understand your question, 1; different things, 1; no good at all, 1; do not know, 7.

3. **Decay; Pulp Removal; Pyorrhea: 131**
   Tooth decay, 59; letting the teeth decay and then having them pulled, 1; when teeth are too far decayed to have filled, 2; killing of nerves, 1; dead teeth, 4; from filling teeth with dead nerves, 1; loss of one's own, usually due to pyorrhea, 1; pyorrhea, 62.

4. **Diet; Medicines: 117**
   Soft food, 3; improper foods (diet) 107; civilized foods, 2; constant eating of soft foods, 1; deficiency of chemicals and minerals, 2; medicines, 2.

5. **Systemic Disorders: 115**
   Necessary to good health, 8; general ill health, 97; sickness, 4; when your teeth get injurious to health, 1; poor blood condition, 1; to help digest food, 2; something lacking in the system, 1; lack of something in the body to keep teeth in proper condition, 1.

6. **Functional or Structural Disorders: 113**
   Lack of exercise of teeth and gums, 3; to prevent "floating" opposite extracted teeth, 3; helps mastication, 44; poor (soft) (bad) teeth, 54; malocclusion, 3; lack of chewing surface, 1; poorly developed teeth, 1; so we can chew better, 1; when normal teeth are dangerous or malposed beyond orthodontia, 1; deterioration of the structure of the natural teeth, 1; want of adequate masticating surface, 1.

7. **Infections; Abscesses; Diseased Teeth or Gums: 69**
   Infections, 13; infection at the roots of the teeth, 1; infected teeth that are causing other conditions, 1; any tooth removal from infection should be replaced, 1; abscessed teeth, 13; abscessed gums, 2; disease, 22; diseased teeth and gums, 4; trench mouth, 2; diseased teeth, 1; unhealthy teeth and gums, 1; diseased gums, 4; an unhealthy mouth, 1; decay or infection which cannot be treated, 1; trenchmouth, 1; weak gums, 1.

8. **Miscellaneous: 65**
   Poor bone development, 2; bone destruction, 1; lack of calcium, 7; lack of elements in system, 5; toothache, 1; acid condition, 2; heredity, 12; uneven teeth, 1; insufficient calcium phosphate, 5; fault of dentist—doesn't prescribe for the individual patient, 1; my dentist calls them the "wooden leg" of dentistry, 1; they help when teeth are missing, 1; too many fillings, 1; you should have them, 1; I don't think it brings anything, 1; advice from people to have them extracted as they cause this and that ailment which in my case was not so, 1; only substitute for natural teeth, 1; when there is no other way it is the best thing, 1; they are a big help, 1; they are very useful, 1; bad teeth should be removed and replaced at a suitable age, 1; failure of natural teeth to fulfill requirements, 1; gaps in teeth, 1; wearing out of teeth, 1; something like a wooden leg—if you need them you need them, 1; yes, we need them, 1; I hope I'll never have to have them but sometimes they are a necessity as well as very satisfactory. The prices some dentists ask for them make them prohibitive in some cases, 1; worn out teeth, 1; improper protection against decay 1; to chew food and keep mouth in shape, 1; problematical—depends on individual, 1; sometimes—as in my case—unnecessary wholesale extractions, 1; the steady weakening of the system and the teeth and jaws especially, 1; last resort, 1; sometimes artificial teeth are better for your health than your natural ones, 1; they are better than being without, 1; wear out from brushing, 1; something to be put off as long as possible, 1.

9. **Accident: 32**
   Accident, 30; arguing with someone larger than yourself, 1; a fist full of knuckles, in my case, 1.

10. **Appearance: 28**
    False pride, 1; appearance, 21; vanity, 1; helps appearance, 3; looks better than without any, 1; not to look old, 1.

11. **Old Age: Inevitability: 23**
    Perhaps natural accompaniment of old age, 1; age, 17; the majority cannot escape it, 1; modern living makes artificial teeth a necessity, 2; outliving the natural ones, 1; as you grow old the body is unable to supply for the teeth and as a result you lose them, 1.

12. **Combination of Factors: 9**
    90 per cent from lack of care and old age, 1; neglect, and high price of *all* dental work, 1; infections and disintegration, 1; decay of a persons teeth and after extraction the need for something to eat with, 1; mechanical defects and lack of knowledge in caring for and building strong teeth, 1; lack of knowledge or carelessness—sometimes lack of money, 1; speech, appearance and food, 1; tooth starvation and improper mastication, 1; need teeth for chewing and holding the face out, 1.

in such small, unhandy places, they have my sympathy for all the abuse and ingratitude they get and have my admiration for the high standard of work and real good they do for one but I still don't like them as a class. *Most especially I don't like the ones who*: (1) Have their hand in your mouth and ask questions; (2) tell the same jokes each time you come to the office. I don't feel like laughing at a time like that and I don't want to be expected to; (3) those that don't tell you before they hurt you or say it won't hurt and then surprise one; (4) those that have the odor of cigarettes on their hands.

17. I feel you have a helluva nerve in exposing John Public's witch-doctor attitude toward himself. However, since this must be in the eventual best interests of the patients its OK. But—get a few thousand of these questionnaires filled out by some of the forty per cent (?) of those who never have a dentist inspect their molars. Frankly—if your associations have the nerve to carry out some discipline—it would profit the pub-

lic and business, if you would drop some of your so-called ethics and engage in professional education of children through schools, free clinics, magazines, papers, pictures, both moving and poster type: Do this in such a way that no individual dentist could exploit himself—rather carry it out as a whole profession project.

TABLE 12-B—DO YOU THINK IT IS "JUST ONE OF THOSE THINGS" THAT COMES WITH ADVANCED AGE?

ORIGINAL SPECIFICATIONS: 131 **TOTAL REPLIES: 1138**

1. Negative: 679

No. 635; no, the foundation for sound teeth should be laid at birth, 1; no, it can be prevented, 1; no, as long as the system has the proper amount of minerals, artificial teeth will never be required, 1; no, sometimes sickness, 1; not in most cases, 1; with proper care and food teeth should last a lifetime, 1; no, not entirely, 2; with proper care and diet from childhood and possession of fairly good health, I see no reason for loss of one's teeth, 1; with proper diet and care of teeth all through life, artificial teeth might be eliminated, 1; no—not to any great degree, 1; with proper care, they should be kept a lifetime, 5; no, diet and proper care would almost eliminate artificial teeth, 1; no, if you take care of your teeth and brush them you will have good teeth no matter how old you are, 1; no, not if teeth are properly cared for, 1; no, a call on your dentist once a year (twice would be better) and there would be no need for poor teeth at any age if the party lives up to this, 1; not at all—with proper care and good general health the teeth should last a lifetime, 1; barring accidents, and with intelligent care the teeth should last throughout life, 1; no, periodical treatment can save the teeth, 1; no, but many at old age, in the present day, did not have the care provided to educate the younger generation, 1; no. (Fingernails don't drop out at 50) 1; no, I think teeth cared for can last an average lifetime, 1; no, it can be prevented, 1; proper care will preserve teeth until eternity, 1; no, with care they will last a lifetime, 3; I hope not! I intend to die with my own teeth, 1; with care, we should be able to take them to the grave, 5; no, extractions may be avoided with proper care, 1; no, good health and good care should make this unnecessary, 3; no—yes, after you are about 100, 1; the ancients, by observing skulls, had their own teeth regardless of age, 1; never, unless you live a mighty long time, 1.

2. Partly or Often: 176

Yes, and No, 10; no, not always, 21; only to a certain extent, 6; often, 2; inevitable for some types of teeth, 5; not necessarily, 76; sometimes, 24; partly, 2; yes, to a degree, 6; possibly, but some people have hard teeth naturally, 1; not always, 20; yes, for about 75 per cent, 1; yes, with 80 per cent of the people, 1; in 60 per cent of cases, yes—because of early diet and other things out of patient's control, 1.

3. Can Be Deferred: 86

Could be postponed with care, 81; with proper diet, assimilation and care they should last as long as the general health, 1; yes, but it can be deferred to some extent, 1; not necessarily, proper diet and care of teeth will preserve them indefinitely, 1; naturally the teeth wear out with the rest of the body—but they can be preserved with care, 1; proper dentistry should prevent much of this, 1.

4. Affirmative: 71

Yes, to 99 per cent of our population, 1; yes, usually, 4; yes, 57; yes, but why? 1; yes, if teeth are not properly cared for, 1; looks like it, 1; in most cases sooner or later, 1; yes, quite often, 1; not always, but common, 1; it would almost seem to be, 1; yes, one either has good teeth or doesn't, 1; yes, just as baldness does, 1.

5. Uncertain or Indefinite: 39

No answer, 16; do not know, 4; probably, 1; no answer, 11; not in my case, 1; do not know, 3; no, but there might be something in that, 1; possibly, 1; no, experience in the family in following the advanced idea as well as the old idea proves the value of the "new" idea, 1.

6. Conditional: 31

Not if cared for in early years, 5; sometimes, unavoidable, 2; not if person is in good health, 4; depends on individual condition of gums and teeth and health, 8; depends on age, diet, and care, 3; depends on the person, 3; depends on general health and diet as the years advance, 1; depends on care you give your teeth, 3; not necessary if properly taken care of when young, 1; like loss of hair—it varies with individual and care, 1.

7. Neglect: Improper Care; Diet; Sickness; Modern Civilization; Other Factors: 25

Often due to carelessness, 3; bad health, 2; increasing today because of highly refined diets, 2; comes of poor treatment of teeth, 1; eating proper foods helps preserve natural teeth, 3; lack of sufficient vitamins, 1; comes from diseased teeth, 1; when one hasn't the financial means it is easy to put off dental work until one is forced to have artificial teeth, 1; regrettable, could be prevented by intelligent early and subsequent care, 1; not if one has good health, eats proper food and takes good care of their teeth. I don't believe one person in a hundred appreciates good teeth until it is too late. I wish there was a law compelling everyone to visit a dentist every 6 months or oftener, 1; no, lack of attention, 1; sometimes sooner than ought to by neglect, 1; comes from neglect and ill health, 1; the teeth were made to last a lifetime—it is our modern conditions which upset them, 1; not necessarily—present "civilization" (?) with its foods, customs, etc., is gradually making teeth unnecessary, 1; neglect, in early life, caused by fear of dentists, 1; only people who have been careless have artificial teeth, 1; childbirth robs women of necessary things for retaining teeth, 1; not necessarily, but with our present methods of preparing foods and neglect, in the rush of our present mode of life, most people do not develop good teeth, nor preserve them when they do, 1.

8. Age Relation: 12

A certain amount of recession is certain to take place along with advanced age, 1; there are exceptions, of course, but it is only natural to assume that advancing years, bring about a certain amount of teeth and mouth deterioration, the same as it does to every other part of the body, 1; not necessarily, but most old people are not physically strong and the body cannot care for the teeth properly, 1; it usually comes with advanced age but is not necessarily because of it, 1; it has something to do with it, 1; not necessarily, but seems to be first part of physique to deteriorate, 1; not altogether, though naturally the whole body begins to wear out with old age, 1; not necessarily—although it would indeed be unusual for a set of teeth not to show abscesses under x-ray at advanced ages, even if other defects were not evident, 1; not any more so than eyes or hearing, 1; not necessarily, but the teeth like any other function of the human body wear out, 1; no, but it becomes harder to preserve them and they become more brittle, 1; ones whole body feels the toll of age—and teeth are not excepted, 1.

9. Miscellaneous: 9

There is no proof that it isn't, 1; some luck, 1; it isn't so bad in advanced age but for young or middle-aged it is just too bad, 1; I think one inherits good teeth, 2; it did with me, I am past 70 and have had false teeth for 40 years. Ha! Ha! 1: if there were more fillings there would be less bridges, 1; a lot of people need teeth but can't afford them, 1; generally, yes, since "4 out of 5 have it" and the doctors know no cure for it, 1.

10. Any Age: 6

No, young folks lose theirs, 1; some very young people have artificial teeth, 2; no, I had mine at 21, 1; no, many young people have been forced to have them, 1; any age, 1.

11. Should Not Be True: 4

It shouldn't be, 1; no, this shouldn't be true, but it usually is, 1; it should never be so, 1; probably shouldn't be—but the number of *older* people with false teeth is greater than those without, 1.

Simplified Technique for Constructing Full Cast Pinledge

CHARLES N. FIERO, D.D.S., Erie, Pennsylvania

THE ADVANTAGES of the full cast pinledge over the pinledge made by casting gold against wire pins are many and varied; however, the difficulty of casting fine, accurate pins of almost machine-cut precision, has resulted in the more general use of the wire pins.

I use slightly tapered pins of a gauge considerably larger than that of the wire pins commonly used.

Advantages

1. The enormous retentive property of accurately cast pins that will have frictional contact with tooth structure over their entire length.

2. The retentive property obviates the necessity for making both proximal slices on the abutment tooth when contact with the adjacent tooth is perfect.

3. These slightly tapering pins compensate for discrepancies in absolute parallelism which are so apt to occur in cutting the pinholes; nevertheless when the pinledge is seated, full length contact of pins is maintained.

4. The ease and rapidity of construction with resulting pins of almost machine-cut precision.

5. Elimination of any necessity to relieve any side of a pinhole in order to seat casting, with the consequent space formed by the relieved spot when the casting is finally seated.

Technique

Because all dentists are familiar with the initial preparation for a pinledge, only that part beginning with the cutting of the pinholes centered in the three seats, through the final casting, will be considered here.

An Upper Cuspid Will Be Discussed

The two straight handpiece burs used are numbers ½ round and 700 tapered fissure.

1. Make a definite center or starting point in each of the three seats, using a number ½ round bur and cutting to a depth of the bur head. This later saves time in locating the centers of the remaining two seats after the first pinhole has been cut and thus lessens the danger of losing the parallel relationship between the handpiece and tooth once it is established. The same bur is now placed

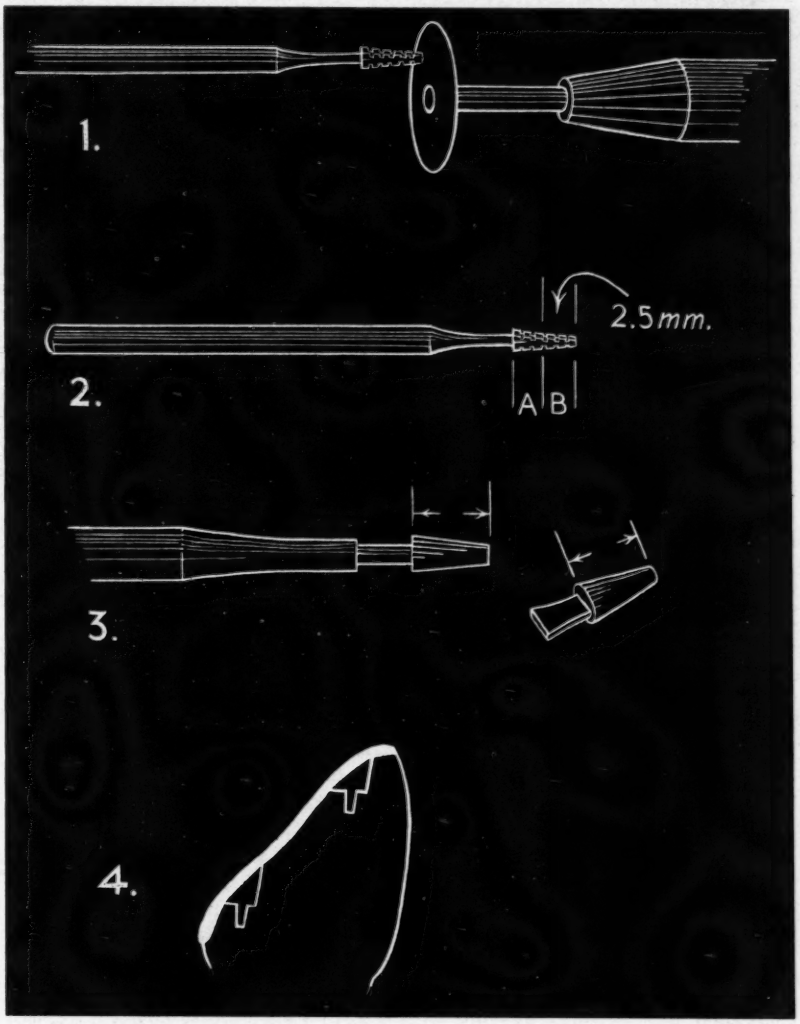


Fig. 1—Discing off the end cutting blades.

Fig. 2—A, portion of bur ground off; B, portion retained for use.

Fig. 3—How tapered pin with flattened portion of stem is cut off bur blank.

Fig. 4—Section of a die showing seats and the pinholes which have been left by the removal of the pins. Heavy line on lingual represents 30 gauge sheet wax luted to die. It is unnecessary to fill seats and pinholes with wax.

in the center of the left seat. With the handpiece parallel with the long axis of the tooth, proceed to cut a hole 2.5 mm. deep, remove and follow in the right seat; then the remaining seat at the cingulum.

It is important to keep the handpiece parallel at all times with the long axis of the tooth. The three holes will be parallel to one another. Pinholes 2.5 mm. deep of variable diameter, made with a number 700 tapered fissure bur, have been found sufficiently strong for all conditions.

The number 700 tapered fissure bur, which is next used, must first be prepared in the following manner:

Disc off the end cutting blades as illustrated in Fig. 1. The purpose of this step is to provide just enough clearance to enable the pins to come away with the tube impressions, as will be seen later.

Next, grind off the heel of the taper, so that the length of the tapered fissure bur becomes 2.5 mm. This is best accomplished by placing a bur in the handpiece and while running in the opposite direction grinding with a small stone in a portable laboratory motor until the desired length is obtained; namely, 2.5 mm. The purpose of this step is to design a depth gauge for the pinholes (Fig. 2).

2. The prepared bur is now used to ream out the pinholes which have been cut with the number ½ round bur and at the same time will indicate whether the correct depth has been obtained. If too shallow, cut deeper with a number ½ round bur; then follow with fissure bur again. In reaming pinholes it is necessary to maintain the same parallel relationship between the handpiece and long axis of the tooth.

The preparation of the tooth is now completed, and an inlay wax bite of it should be taken.

3. A piece of inlay wax of sufficient size is softened and pressed against the prepared tooth and proximal side of the adjacent tooth; the patient is instructed to bite and hold until the wax can be chilled. The excess wax is trimmed off but no effort is made to carve the pattern.

This wax bite is now removed and placed in a glass of water for safekeeping.

There are three objects in taking this inlay wax bite: (1) to secure the thickness of material; (2) to secure contact point with the adjacent tooth, and (3) to secure a copy of the seats and small nibs of wax which will barely enter pinholes.

4. A tube impression is taken in compound of the prepared tooth with three machine-cut pins in position in the pinholes. Herein lies the secret of the precision and accuracy of these cast pins.

These pins can be obtained from a bur manufacturer and are merely the number 700 tapered fissure bur blanks before the blades have been cut into them.

To prepare for this, file two flat sides on the stem of the bur blank above the heel of the taper and cut off the taper leaving a sufficient amount of the flattened portion of the stem to make it easy to grasp with pliers (Fig. 3).

When not in use these pins should be kept in a bath of oil. Wipe dry before using. The tube impression taken in the usual manner will come away with the three pins held firmly in the compound.

5. A die of straight cristobalite is carefully painted in with a fine brush and allowed to set and dry over-night. Such a small quantity of cristobalite demands careful attention to thorough mixing.

6. With dry heat the impression is carefully removed, the pins remaining in the die temporarily. With a pencil, lightly indicate the margins of preparation on the die. The pins may now be removed. This is best accomplished by heating the pliers before grasping the flattened end of the pin when a gentle turn will release the pin, so that it can be readily removed. These pins are really false cores, and on removal leave perfect molds in the die into which the molten gold will flow.

7. With a chip blower, the inlay wax is dried and by means of nibs and seats on the cavity side the wax bite is accurately adjusted then luted to the die. The wax carving is now completed, care being exercised that the contact spot on the proximal and thickness spot on the lingual are not disturbed.

8. Sprue into a drop of sticky wax near the incisal with the sprue set parallel to the pins; then soak in water before completing investment in straight cristobalite.

9. Burn out in the usual manner and cast in any good three-quarter crown hard gold.

Variation in Technique

If only one proximal slice is used, the inlay wax bite can be eliminated. Assume that the preparation has cleared the bite at approximately 30 gauge thickness.

After the preparation has been outlined and the pins removed from the die, adapt a piece of 30 gauge sheet wax to the die and lute the edges; fill in over the seats with a drop of wax if necessary; then proceed as described.

The pinholes should be protected between appointments by filling with wisps of cotton which have been dipped in eugenol. Dry with warm air; then apply cavity lining.

Application of Pins to Ordinary Inlays

The greatly increased retention that these pins afford when used in ordinary inlays can readily be seen.

1. When the amalgam die is used in the indirect method, always make sure that the pins are free before carving the wax pattern; otherwise the pins might not come away from the die with the pattern.

2. From this point on, the indirect and direct methods follow the same steps in investing, assuming that the patterns in both cases have been sprued before removal from cavities.

3. Mix a small quantity of investment thoroughly and with a fine brush invest the cavity side of the pattern, covering the pins well. After setting, heat the pliers and remove the pins; then with a drop of wax seal the holes in the pattern made by the removal of the pins. Soak in water as with pinledge die before completing investment.

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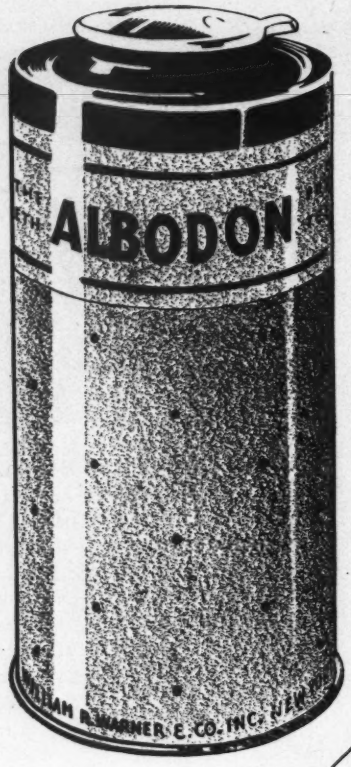

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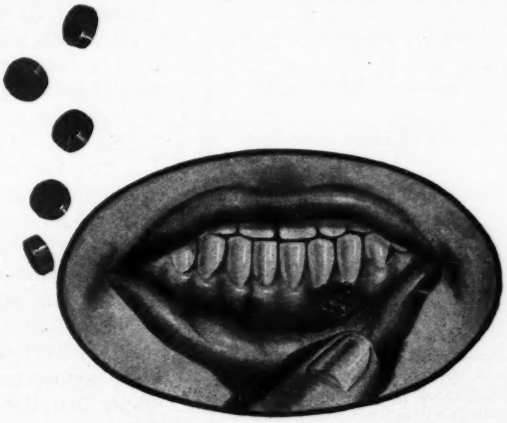

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The Buffer Value of the Saliva and its Relation to Dental Caries

(Continued from page 238)

The hydrogen ion concentration of the incubated saliva is determined. Then exactly 10 cc. of the sterilized portion of saliva are measured into the glass potentiometer cup, an excess of quinhydrone added, and the hydrogen ion concentration is determined. Finally, tenth-normal hydrochloric acid is added in 1 cc. portions, until the hydrogen ion concentration is identical with that of the incubated saliva. The amount of hydrochloric acid used thus becomes a direct index of the ability of the bacteria to produce acid in the given sample of saliva.

The results obtained from following this procedure among ten people is shown in Table 5. Collections were made in all cases both before and after breakfast.

Conclusions

1. The pre-breakfast sample develops more acid and a greater absolute acidity than does the post-breakfast sample. Other studies have shown as well that the pre-breakfast sample also contains a far greater number of bacteria.

2. The greatest amount of acid is produced in the *pre*-breakfast saliva from the immune persons. This is not interpreted to mean that there are more acidogenic bacteria in such saliva but that, since the well-buffered saliva from immune persons retains a reaction favorable to the rapid growth and metabolism of the bacteria longer than does the poorly-buffered saliva of susceptible persons, more acid is produced in the same length of time. The number of bacteria in these pre-breakfast samples is tremendous.

3. The amount of acid produced in the post-breakfast saliva samples is approximately the same regardless of the dental classification (average is approximately 12 cc. hundredth-normal acid).

4. The hydrogen ion concentration of the post-breakfast saliva samples from immune persons or nonsusceptible persons remains high (*p*H from 5.8 to 6.8), because of the high-buffer content. At this hydrogen ion concen-

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tration, dental enamel is not dissolved; therefore, it might be possible to incubate enamel with post-breakfast, saliva for four hours and recover all the enamel.[4] This might serve as a direct, but cumbersome, test for immunity to dental caries. The value of such a test would depend, however, on when the saliva was collected.

5. The hydrogen ion concentration of the incubated, post-breakfast, saliva samples from susceptible persons is reduced to that corresponding with a *pH* 4.8 to 5.6 because such saliva samples are poorly buffered. Dental enamel would, without question, dissolve in a liquid that developed this much acidity.

Summary of Conclusions

1. The saliva of people who are immune to dental caries is alkaline and well-buffered, even before breakfast. This suggests that the same quality of saliva is also secreted during the night. Considerable acid must be added to such saliva to reduce the *pH* to 6.0; or, in other words, to about the point where it will actively attack dental enamel. Samples of such saliva collected after breakfast, and incubated for four hours, do not become sufficiently acid to attack dental enamel. The inference is that the teeth of immune persons do not decay because the saliva is of good quality, and prevents the production of a degree of acidity that is dangerous to dental enamel.

2. The saliva of persons who are temporarily not susceptible to dental caries is approximately like that of immune persons.

3. The saliva of those who are susceptible to dental caries is usually acid in reaction before breakfast, and poorly-buffered up to about ten o'clock in the morning. A small amount of acid is sufficient to reduce the *pH* to 6.0 or below. Samples of such saliva collected after breakfast, but before ten o'clock in the morning, and incubated for four hours, become sufficiently acid to attack dental enamel. The inference is that the teeth of susceptible persons decay because the saliva is of poor quality, and permits the development of sufficient acidity in the mouth and about the teeth to be destructive to enamel.

4. The teeth may, in some cases, or in some regions, be so heavily coated

[4]Enright, J. J.; Friesell, H. E., and Trescher, M. O.: Studies of the Cause and Nature of Dental Caries, J. D. Res. 12:759-851 (1933).

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with plaques that even a good quality saliva is unable to penetrate sufficiently to prevent a destruction of the tooth. Some, on the contrary, keep their teeth so clean, or may have such extensive restorations, that even poor quality saliva is able to prevent a dangerous accumulation of acid.

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Adaptations from the Literature

Preventive Dentistry: A Significant Quotation

[Cecil D. Hearman, D.D.Sc., L.D.S.: Practical Juvenile and Preventive Dentistry, Preventive Section, The Australian Journal of Dentistry, **40**:464 (December 1) 1936.]

"AS A PROFESSION, our efforts in the preventive field may be likened to the bachelor's children—none to speak of! I often wonder what the public must think of a profession that devotes 90 per cent of its energies to the successful restoration of damage caused by a disease which is preventable! There is absolutely no necessity to adopt faddish ideas with the national diet. The public should be made to realize the penalties following excess consumption of carbohydrate, and the value of roughage and natural foods. Meals should be regulated so that the detergent foods suggested by Sim Wallace are the last consumed. Children should be taught to rinse the mouth out every time they use the wash basin. By cultivating this habit they soon feel that a mouth full of food débris is intolerable. Judging by the number of well-to-do patients who produce dentures covered with decayed food débris, this habit is one that badly needs cultivating.

"Apart from publicity along the lines suggested, this Association could do much to benefit the health of the community if it initiated several much-needed public reforms. It should actively interest itself in any movement for the betterment of the milk supply and schemes providing for the greater consumption of milk among children. Another reform that is long overdue is the reorganization of school tuck shops. Milk and fruit should be the main commodities offered for sale at school. The Education Department would surely cooper-

ate in introducing this reform in all State schools, a change the public schools should require no incentive to follow. The Fruit Marketing Board might also be approached and urged to institute 'penny stalls' for children at all fruit shops.

"Similarly, the Medical Profession should be approached and shown that 'diseases of the teeth are quite easily preventable, and would be prevented, if the Medical Profession would lend their aid, partly by realizing the nature of the pathological processes, and partly by advocating a rational dietary. The public should realize that if the diseases of the teeth are prevented, the hundreds of thousands of pounds which are spent in their treatment would be saved. So, too, if the diseases of the teeth are prevented, the hundreds of thousands of pounds which are spent in their treatment would be saved. So, too, if the diseases of the teeth are prevented, the millions of pounds which are spent on the treatment of diseases resulting from diseased teeth would also be saved' . . .

"It would be far getter to spend money spreading preventive information and teaching correct oral hygiene than on clinics existing solely for the treatment of children's teeth. What is the real value of such clinics when the children of the wealthy, who do not suffer the disability of being unable to obtain treatment, possess teeth which are no better than those of the poorer classes? The main duty of all public clinics should be to *prevent*. When this is fully realized and correct preventive information is given to the right people at the right time, then will the surgical side of dentistry become automatically of secondary importance."

National Health Insurance Scheme

[Excerpt from The Lancet. Quoted in The New Zealand Dental Journal, 33:42 (January) 1937.]

". . . Almost uncoordinated with medical benefit, is the provision of dental treatment under the national health insurance scheme. The public money spent each year on dental benefit amounts to nearly £2,000,000, in addition to what is almost an equal amount paid by the patients as their quota, and there is a growing doubt

whether the money is spent to the best advantage. The sum expended is considerably less than the sum available; a substantial proportion of the dental letters issued are not used by the patients, and there is no disposition to question the statement made in the annual report of the chief medical officer of the Ministry of Health for 1933 that 'in the number of cases in which the treatment falls short of a reasonably satisfactory standard is still far too high.' It may well be doubted whether the approved societies, constituted primarily to pay cash benefits, are the right kind of local bodies to administer a health service, and whether the arrangements for the engagement and remuneration of the dentists are calculated to secure a high standard of professional work. In dental benefit the principle of free choice is pushed to the utmost limit. There is no panel of dentists; the patient can take his dental letter to any dentist he chooses. The patient pays part of the cost of treatment, except in cases in which it does not exceed 10s., and this arrangement offers opportunities for various forms of "contracting out" which are difficult to detect or prevent, while the kind of supervision that the regional dental officers are in a position to exercise can hardly be expected to give the best results. The provision of dental service as a statutory health insurance benefit was considered ten years ago by the Royal Commission on National Health Insurance, but was not recommended largely because of the high cost it would entail. Cost is still an important matter. Money should be spent where it will produce the maximum return, and unless a searching inquiry furnishes proof to the contrary, it will continue to be held that it is not by further expenditure on insurance dentistry that maximum returns will be secured.

"Some would urge that it is in the field of research that the fullest returns are to be obtained. Why does dental disease exist? Is it entirely or mainly a matter of nutrition, or are there other important factors at work, and, if so, what factors and what is their relative importance? To these questions different answers would be given by authorities whose opinions are entitled to a respectful hearing. But whatever else may be doubtful there will, we think, be general agreement that no scheme of national dental services would be satisfactory that

One-Sided Chewing

Impairs Mouth Comfort and Body Health

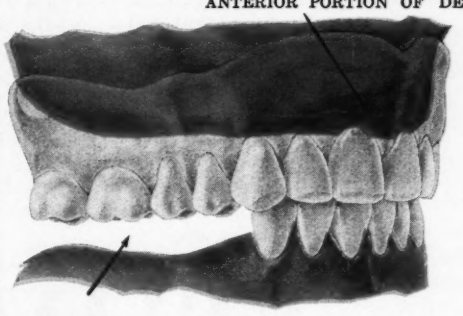
Figure 1

Figure 1 shows a *poorly balanced* meal—one confined to meat, bread, potatoes and coffee. They provide a too one-sided diet. The result may be indigestion, intestinal disturbances, body discomfort and lowered health due to the lack of essential vitamins and mineral salts.

Figure 2

Figure 2 represents a *well-balanced* meal—a meal that includes milk and raw and freshly cooked fruits and vegetables, as well as meat, bread and potatoes. Such meals feel better in the stomach than poorly balanced meals. And they promote good digestion and assimilation and supply your body with a normal quota of strength and energy elements.

Health demands well-balanced chewing as well as well-balanced diet

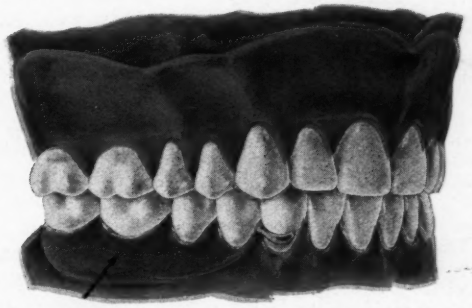


UNBALANCED OCCLUSION

Figure 3

Figure 3 pictures *unbalanced chewing*, a condition all too commonly met with by the dentist—the case where many teeth in the upper denture must strike on empty space, because so many of the lower back teeth are missing. "Unbalanced occlusion," the dentist calls it. And unless corrected, you can expect only *one-sided chewing*, half-masticated food passing into your stomach, causing indigestion and intestinal upsets, and a gradually lowered state of health.

And you can also expect a denture that rocks under pressure to cause gum irritation, mouth discomfort, and gradual destruction not only of the tissues supporting the denture, but also of your remaining natural teeth through overwork caused by one-sided chewing.



PARTIAL DENTURE

Figure 4

Figure 4 illustrates *well-balanced chewing*. Note that here every tooth in the upper denture meets a corresponding tooth in the lower jaw. As there are no teeth missing in either jaw, the denture wearer can bite and chew equally well on both sides of the mouth.

As a result, he commands the masticating efficiency needed for passing the food he eats into the stomach in a proper state for perfect digestion and assimilation. His food therefore agrees with him better, and does him a lot more good. And because his chewing capacity is *two-sided* instead of *one-sided*, his delicate gum-ridges are spared a great deal of unnatural irritation and strain. His denture stays in place better, feels more comfortable, and looks more natural.

Now the foregoing does not make a comforting picture. But there is no need to be discouraged. For here is a condition under your control. It is possible for your dentist to restore missing teeth by means of a partial denture. And for the sake of your health, comfort and personal appearance, you should have him do it.

did not include provision for increasing the stock of knowledge of the causes and prevention of dental disease."

Comments of Participating Dentists in Patient Study

MOST OF THE dentists who cooperated in the patient study, WHAT TWELVE HUNDRED PATIENTS KNOW ABOUT DENTISTRY, have submitted their reactions to the results of this survey. Space will not permit the publication of all the comments in any one issue of the magazine. The comments will, therefore, appear serially in this section of the magazine, in the order in which they were received. The report itself has been appearing since the January issue of this year and is concluded this month.

1. Owing to the manner in which the survey was conducted, WHAT TWELVE HUNDRED PATIENTS KNOW ABOUT DENTISTRY might well be labeled: WHAT THE ADULT POPULATION OF AMERICA KNOW ABOUT DENTISTRY. Furthermore, a suitable subtitle almost suggests itself and might truthfully read: "IS A SHAME!"

I could write volumes of comments about the article, which represents a great deal of hard work on the part of the DIGEST staff as evidenced by the intelligent tabulation, only one of which seems worth printing:

An educational campaign must be instigated at once if the future success of our profession is to be measured. Since The American Dental Association either can't or won't sponsor such an undertaking, it is up to every dentist in America to conduct a one-man course in dentistry for his patients.—SETH W. SHIELDS, D.D.S., *Darlington, Indiana.*

2. To me the result of this survey shows one thing; that is, the importance of dental education to the laity. It seems to me that each graduate in dentistry should be taught to explain to every patient conditions found, and satisfactory means of correcting them. When a patient presents himself in your office a tooth

seemingly means very little to him, outside of the fact that it is a causative factor in producing trouble. If every dentist would take a little time to explain, and show why the particular trouble is existing, and what the probable outcome will be, people would gradually become more tooth conscious. The average individual is greatly interested and anxious to know the facts. It might be well for us to remember that terms common to the profession are entirely foreign to the laity; therefore every dentist ought to talk in terms the patient can readily understand. Such educational methods are slow; yet if properly handled will prove satisfactory.

In the lower educational brackets, it is surprising to find the number of people who read articles prepared for print in the public press. It would seem that some type of, or series of articles, published in the daily press might prove beneficial. I realize fully the dangers of such proceedings; however, if prepared and supervised by a competent committee of the American Dental Association, I think it might do a great deal toward getting a better understanding and appreciation of dentistry.

Dental inspection and instruction, under the supervision of the dentist in the public schools throughout the country, would produce an ideal situation for future generations. In a survey made several years ago of the school children of the sixth, seventh, and eighth grades of Columbus, Ohio, the lack of dental care was appalling, yet nothing has ever been done to correct it.

Until the time of closer cooperation, free of jealousy or selfishness among the members of the profession, it will be a difficult matter to establish any constructive program along such lines. Experiments carried on in the public school system of Atlanta, Georgia, by Superintendent Willis A. Sutton show the definite advantages of periodic dental inspection and instructions, both to the children and the tax payers. It is to be hoped that such work may some day be carried out in every school system throughout the country.—R. M. APPLEMAN, D.D.S., *Columbus, Ohio.*

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3. WHAT TWELVE HUNDRED PATIENTS KNOW ABOUT DENTISTRY speaks well for the native intelligence of the aver-

age dental patient. It is my personal belief that the majority of the answers submitted to all questions were, with the exception of 3 and 5, based on personal experience and observation rather than on the educational activities of any individual or group of individuals.

The response to question 9 gives a striking example of the good common sense of the majority of the American people. Through their own personal experiences they have found that the dentifrice bears approximately the same relation to the toothbrush as soap bears to the washing machine.

The response to question 3, is at first glance rather startling. From my own personal experiences, however, I believe that the majority who attributed decay to diet were referring more particularly to general health, and the question itself had a tendency to lead to a narrow reply.

The vague and indefinite answers to question 5, are not at all surprising, for in view of the confusion that exists in the minds of both physicians and dentists in regard to pyorrhea it should have been expected that the replies would come in the form of objective symptoms.

The editorial comment on the tabulated replies of the individual questions is so self-evidently based on long hours of study and careful analysis that further comment along this line would prove not only valueless but futile.

The sum and substance of the entire survey would indicate that there is a crying need for a type of education based on a rational concept of dental practice. This brings up the question. "What is the rational concept of dentistry?" We cannot answer for as a profession we have none. Dentistry has apparently not reached that stage of maturity wherein it has been possible to establish a generally applicable rationale of procedure.

This survey has certainly justified itself if it does no more than make apparent the need for the correlation of all known dental information.

The American Association should assume this task and make available to every practicing dentist this information, so that the same general story would be told to the dental patient in Maine as in California. It would furthermore seem logical that organized dentistry should interest itself in the adequate training of the

dental hygienist, and then take the necessary steps that will make her universally recognized as an indispensable part of our educational system.—P. H. Belding, D.D.S., *Waucoma, Iowa.*

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4. There is a need for dental study in the application of public education methods.

The tabulated results of the survey made of the dental knowledge of the average patient reveals a number of important facts about the status of the relationship between the dentist and his patient; for it must be remembered that this particular questionnaire was answered by a picked few of the general public; namely those actually experiencing at the time, the necessity for dental services or treatment, either of their own free will or because of the need for relief of pain. In the instance of the questionnaires filled out by my patients one can be sure that they were definitely conscious of their teeth, for each patient was in the process of getting ready to have a tooth or teeth extracted either because of pain, ill health, or failure of various previous dental treatments.

It seems to me that the replies charted in the analysis constitute a challenge to dentists; they indicate that although this group of patients depends more on their dentists for advice and dental health education than on dentrifice advertisements, radio, magazines, and other lay sources, their dentists have to a large degree been able to meet their responsibility. A great many replies reflect dental enthusiasms, or haphazard opinion, and demonstrate a sad lack of ability on the part of the dentist to impart adequate dental knowledge to his patient; however, this failure cannot be laid solely at the door of the dentist, but is also an indictment against the dental college and usual program of the dental society meetings. Apparently the term "public dental health education" still means nothing more than daily cleaning of teeth and toothbrush drill both to the dentist and to the general public.

The dental colleges of this country are in general still *pre-war* in their curriculum. To my knowledge, not a single dental institution has recognized the urgent necessity to include

(*Or please use coupon on page* 271)

in its faculty a chair in dental health education. New York University is making some effort in this direction. As a result, the dentist, in general, today has absolutely no training, no knowledge, nor ability in this important art or science. Such research as is being carried on in this field is being done mainly by public health workers and teachers who are not dentists.

I have recently been making a study of health education research and was unable to find a single adequate piece of work done by dentists. All manuscripts sent to me for study by the Library of Congress were written by school teachers or students in schools of physical education.

This deficiency in the educational background of the average dentist is dangerous. It gives him no experience, perception, or basic training with which to fight the isms arising today in various propaganda for state dental services.

Few dentists today know how to combat or deal with the argument presented by one patient in this survey: "that if the state furnishes free education, why should it not provide free dental services at least for children?" Too frequently is that argument extended to include the words "for all."

The patient who replied to the questionnaire by saying, "pride rather than health sends most individuals to the dentists," is not far from right, although he would have been more correct to say pride and pain. The majority of the answers in this survey state that such things as neglect, hygienic habits, and acidity rather than bacteria are the cause of dental decay. This is because of the overemphasis of the classification and use of dentifrice as cosmetics both by the Council of Dental Therapeutics and by dentifrice advertisers. In other words pride and desire for "teeth like the stars," "flashing luster," "beauty bathed teeth," and teeth "lovely as a melody" are more important to the dental patient today than honest dental health. Even in the dental school, mechanical training in restoration of teeth is a study more greatly stressed than dental medicine, therapeutics, and methods of preservation of dental health.

There was one reply that asks for "information to the public through the printed word and asks that na-

tional magazines of general appeal present the importance of dental hygiene in frequent articles in various angles of approach." Because the dentist has no training in presenting his knowledge of dentistry to the public in words that the public can understand and digest, articles about dentistry in various popular magazines are usually written by lay writers who can: by beauty experts, public health workers, and in some instances by physicians. This trend in popular dental health education of the type called for by the patient cited is further emphasized in the fact that not long ago one well known national magazine returned an article written by me with a letter from the editor saying that while he liked the article very much, he was unable to accept it because all dental articles were written by the staff writers in the cosmetic department. In a tabulation of fifty recent articles about dentistry published in various popular magazines only seven were written by dentists, four of these seven by me.

"I believe that the dental profession should cooperate with the educational system." "It would profit the public and business if you would drop some of your so-called ethics and engage in professional education of children." "Dentists and medical men generally seem banded together through various 'associations,' not so much for the public welfare as to protect one another against criticism and to advance their own importance and pecuniary welfare." These, to our surprise, are the honest opinions of the public, and not a disinterested public, but dental patients. They indicate that the dentist does not get any credit for his welfare work and that his efforts in health education are virtually lost.

Such expressions by the patient are definitely the result of the fact that the average dentist is totally unprepared for the great task of educating the public to the health importance of their teeth, and show the necessity for a program of education of the dentist himself. This, therefore, is the final conclusion which must be drawn from this survey, and not primarily a need for a more understanding patient. That will come when the dentist himself knows how to handle the problem adequately.—DON C. LYONS, D.D.S., M.S., Ph.D., *Jackson, Mich.*

(*To Be Continued Next Month*)

DENTAL MEETING

Dates

Swampscott Convention, Northastern Dental Society, New Ocean House, Swampscott, Massachusetts, June 7-9.

o

American Dental Assistants Association, thirteenth annual meeting, Atlantic City, New Jersey, July 12-16.

o

American Academy of Periodontology, twenty-fourth annual meeting, Claridge Hotel, Atlantic City, New Jersey, July 8-10.

o

American Dental Hygienists Association, annual meeting, Atlantic City, New Jersey, July 12-16.

o

Association of American Women Dentists, sixteenth annual meeting, Atlantic City, New Jersey, July 12-16.

o

American Dental Association, annual meeting, Atlantic City, New Jersey, July 12-16.

o

American Society for the Promotion of Dentistry for Children, Hotel Chelsea, Atlantic City, New Jersey, July 12.

o

Massachusetts Board of Dental Examiners, next examination, Boston, June 16-19. For information address Doctor Frederick A. Keyes, 141 State House, Boston.

o

Delaware Board of Dental Examiners, annual examination, Wilmington, July 7-9. For information address Doctor C. R. Jefferis, 409 Medical Arts Building, Wilmington.

o

Virginia Board of Dental Examiners, regular meeting, Medical College of Virginia, Richmond, June 15. For information address Doctor John M. Hughes, 715 Medical Arts Building, Richmond.

o

New Mexico Board of Dental Examiners, next meeting, Clovis, June 16-18. For information write to Doctor J. J. Clarke, Artesia, New Mexico.

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